Chemical Week

February 9, 1957

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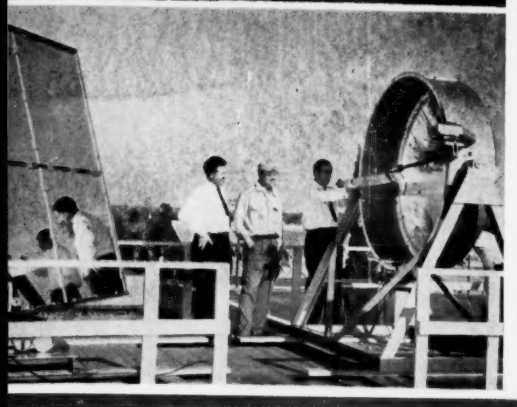

CW Report

Is top management underpaid? . . p. 51

Big chemical unionizing drive is coming, as AFL-CIO spurs merger of rival unions . . . . . p. 21

Alaska's process industries grow, as management sees new potentials in far-north territory . . p. 34

Sun furnace needs no sunlight; new arc source allows indoor operation . . . . . p. 88

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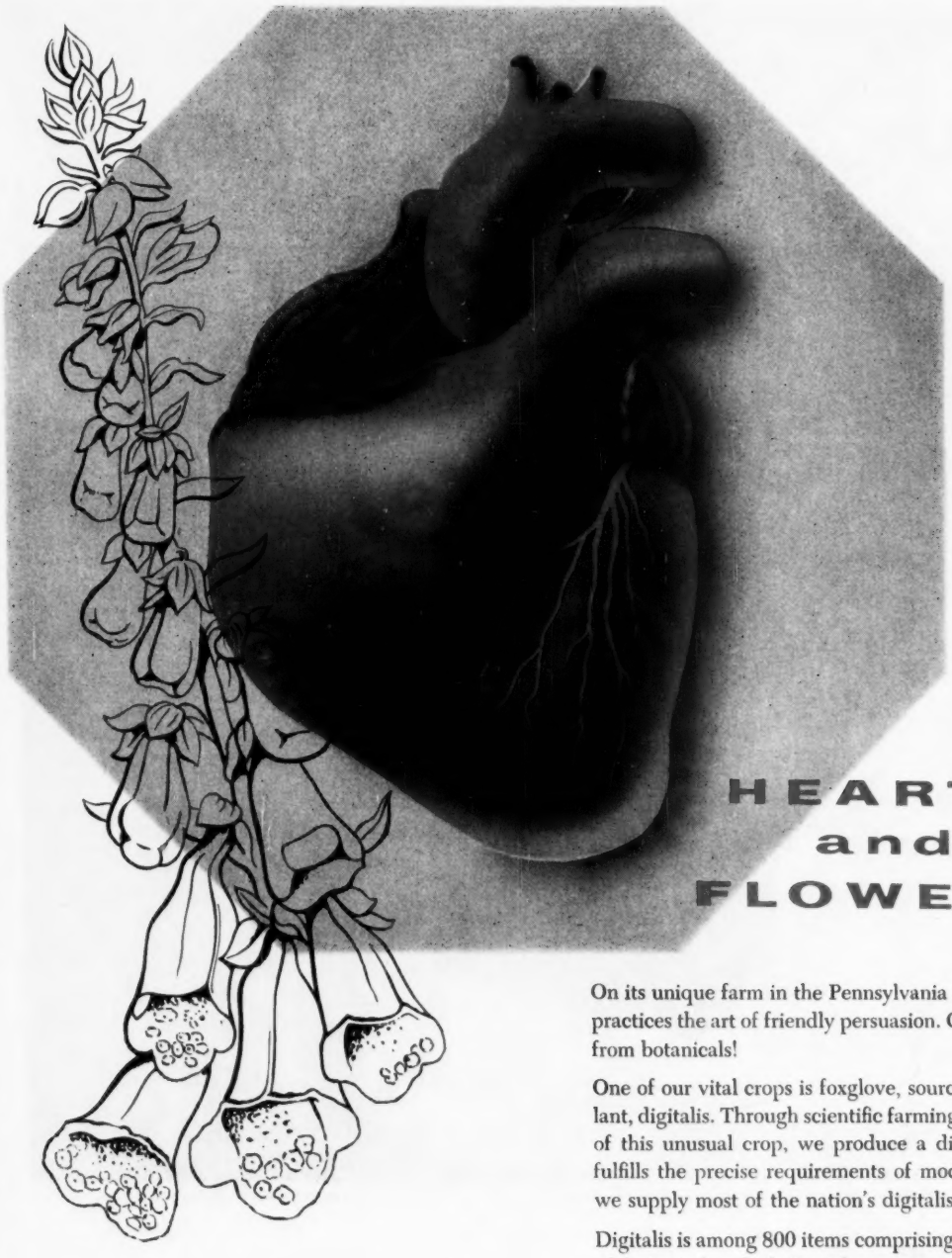

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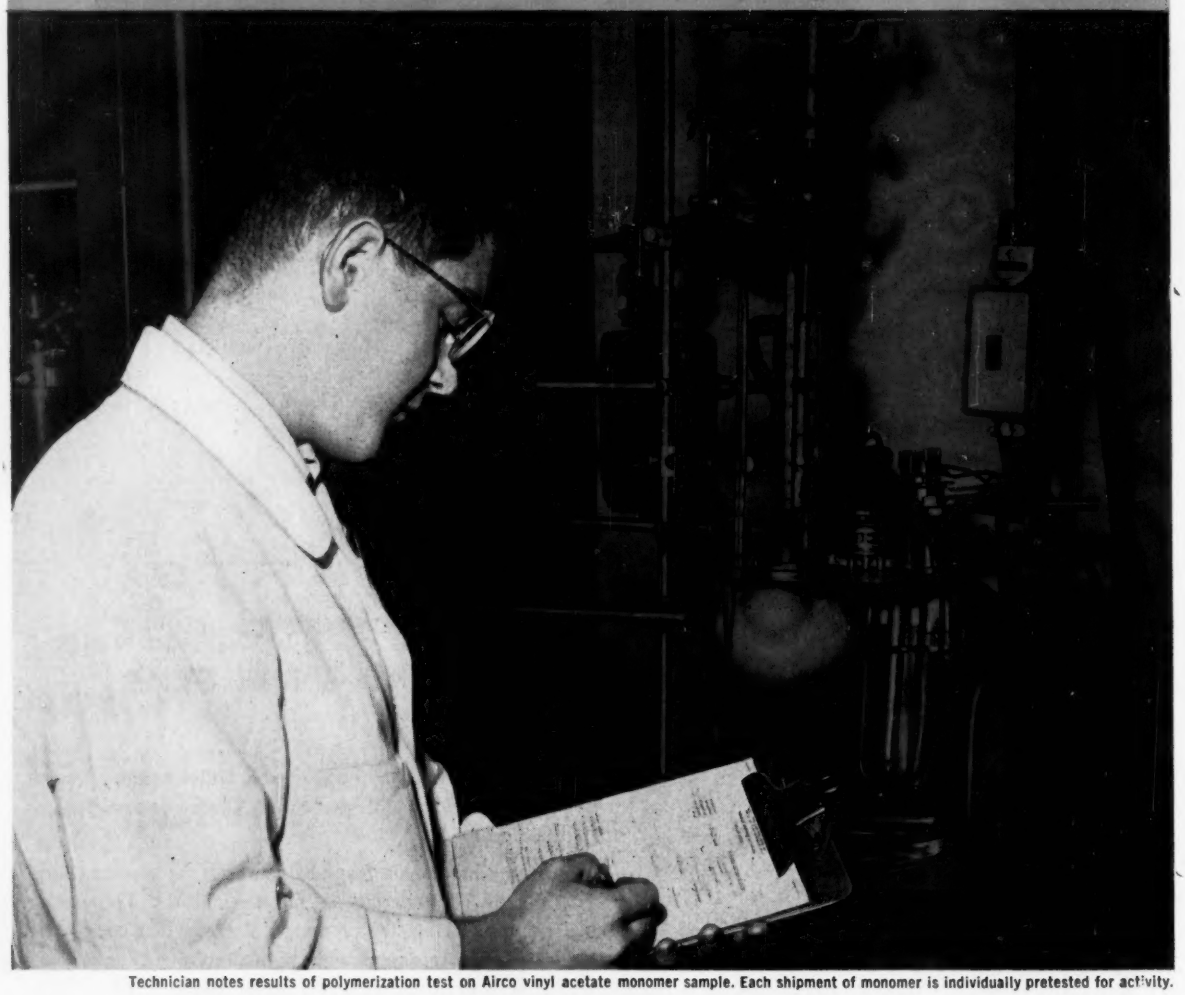

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Chemical Week

TOP OF THE WEEK **February 9, 1957**

Chemical plant spending is going up, MCA survey shows. Some $2.5 billion will be spent for new plants in '57 and '58 .....p. 23

Dow's Texas Division is bolstering its executive team by setting up two management boards .....p. 33

Gibberellin goes commercial, as a consumer product and a formulator's salt are marketed .....p. 65

The 'hard sell' is getting harder—that's what sales management reports in a CW survey .....p. 100

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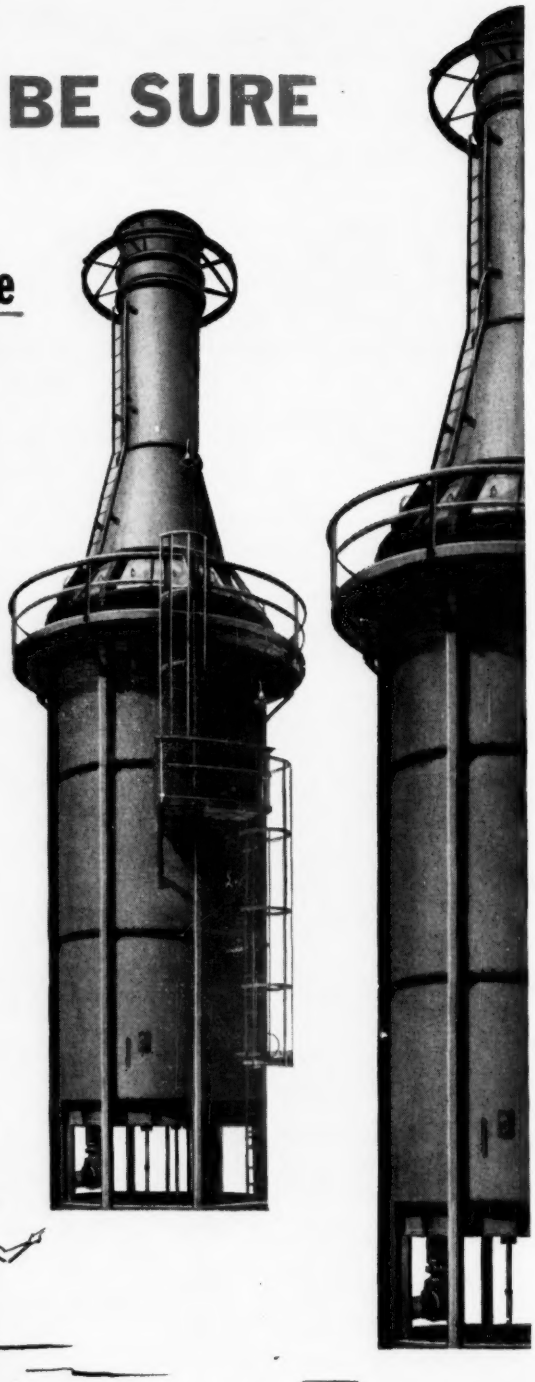

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7—Overload and corresponding transfer load.
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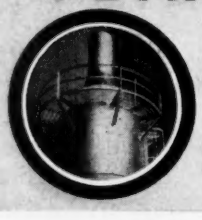

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Chemical Week

February 9, 1957 *Vol. 80, No. 6*

Chemical Week (including Chemical Specialties and Chemical Industries) is published weekly by McGraw-Hill Publishing Company, Inc. James H. McGraw (1860-1948), founder. Executive, Editorial and Advertising Offices: McGraw-Hill Building, 330 W. 42nd St., New York 36, N. Y. Publication Office: 1309 Noble St., Philadelphia 23, Pa. Donald C. McGraw, President; Joseph A. Gerardi, Executive Vice-President and Treasurer; John J. Cooke, Secretary; Nelson Bond, Executive Vice-President, Publications Division; Ralph B. Smith, Vice-President and Editorial Director; Joseph H. Allen, Vice-President and Director of Advertising Sales; A. R. Venezian, Vice-President and Circulation Coordinator.

Subscriptions to Chemical Week are solicited from management men in the chemical process industries. Position and company connection must be indicated on subscription order. Address all subscription communications to Chemical Week Subscription Service, 330 W. 42nd St., New York 36, N. Y., or 1309 Noble St., Philadelphia 23, Pa. Allow one month for change of address.

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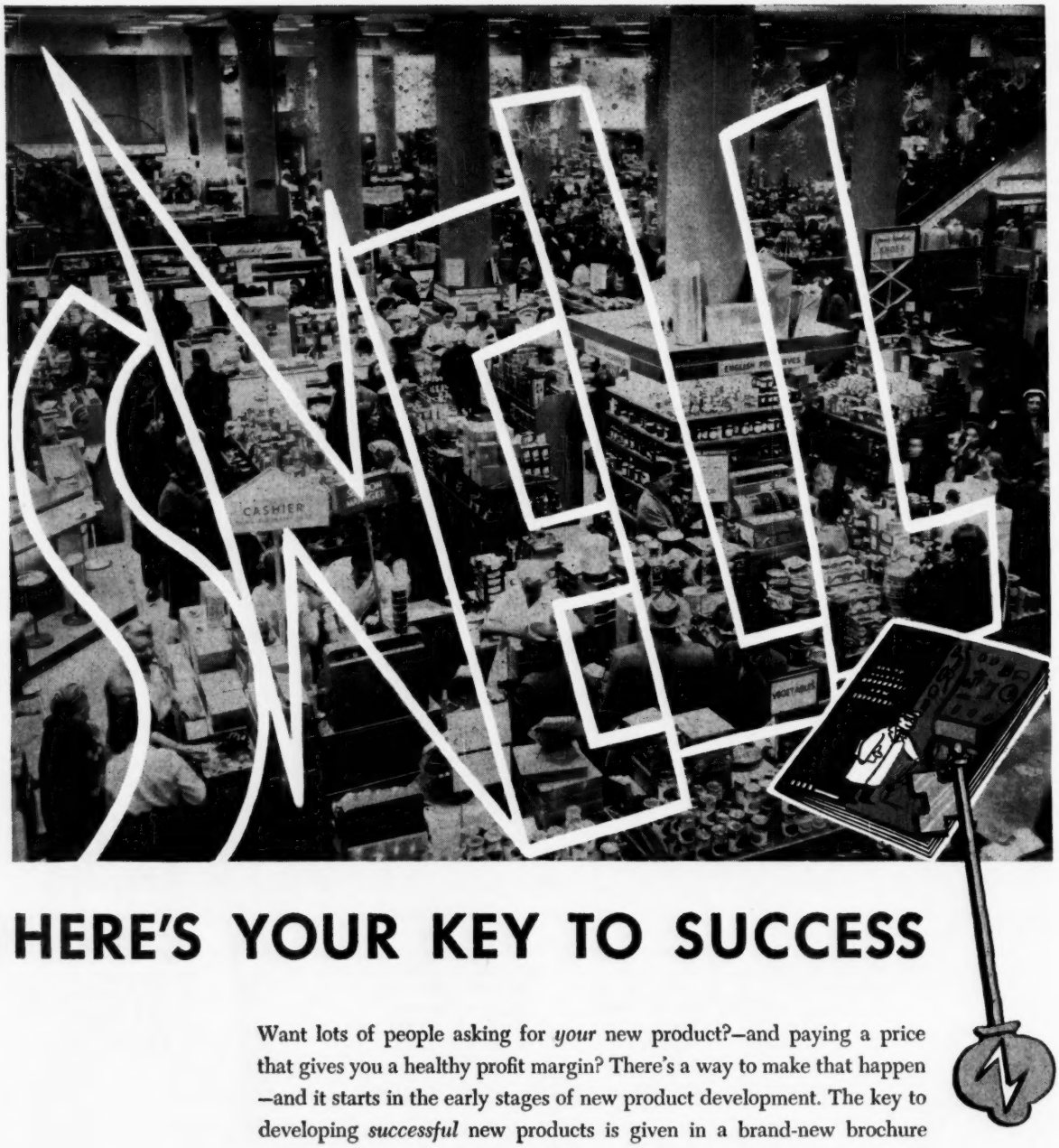

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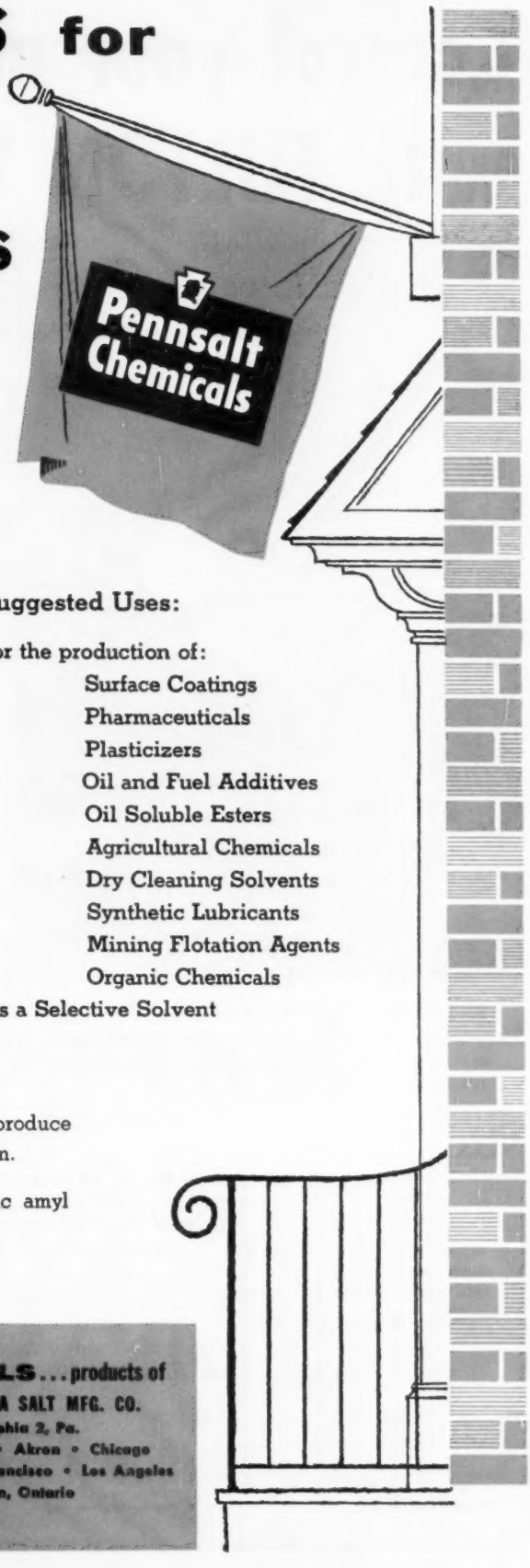

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In addition to the alcohols listed above, we can produce other isomers and blends tailored for your application.

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Control your moisture problem with FULTON WPPL* bags

*Water Proof Paper Lined

—at a lower cost than rigid containers

By: T. R. Moorer, Sales Manager, Bag Division, Atlanta and Savannah Branches

Protecting costly chemicals from moisture, whether in transit or in storage, is only part of the problem. An equally important factor is to do so at the lowest possible cost.

Old-fashioned methods required expensive, heavy, rigid containers to keep moisture in its place. This also added to transportation cost and required extra warehouse space. Fulton WPPL bags have provided the answer.

Today, more and more firms give their chemical products complete, low-cost protection with Fulton WPPL bags. These are made of economical burlap or cotton laminated to paper or polyethylene.† WPPL bags have effected tremendous savings in many industries and should be able to do the same for you.

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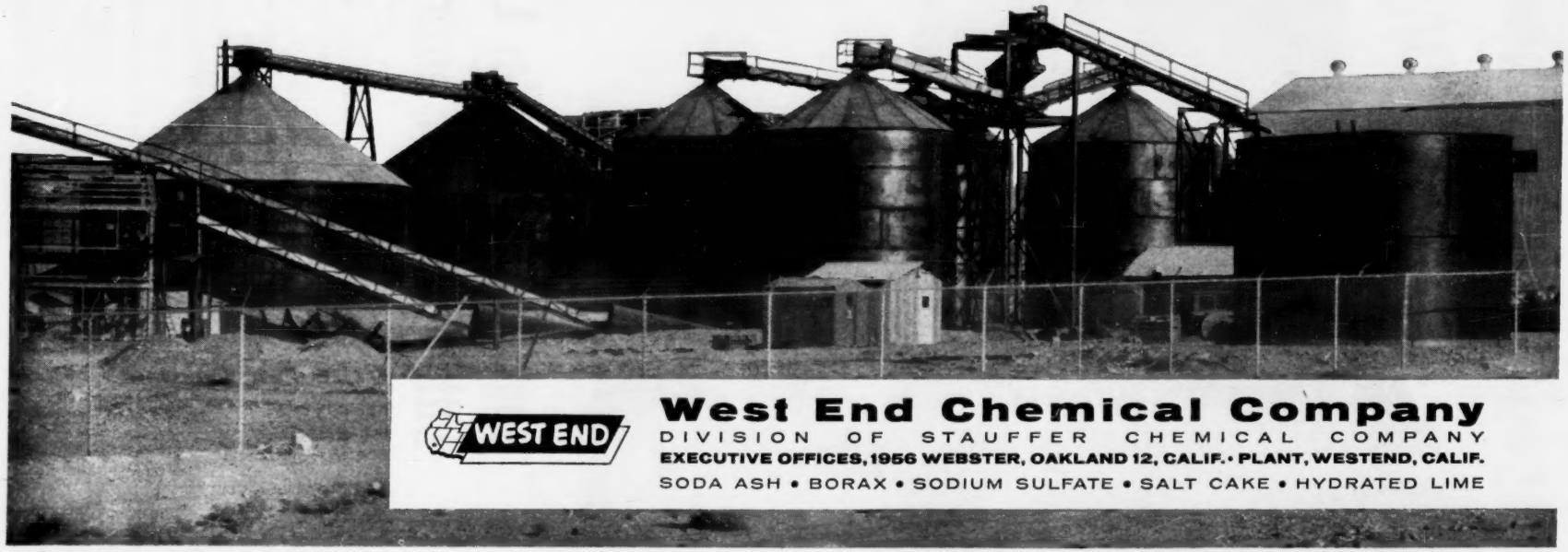

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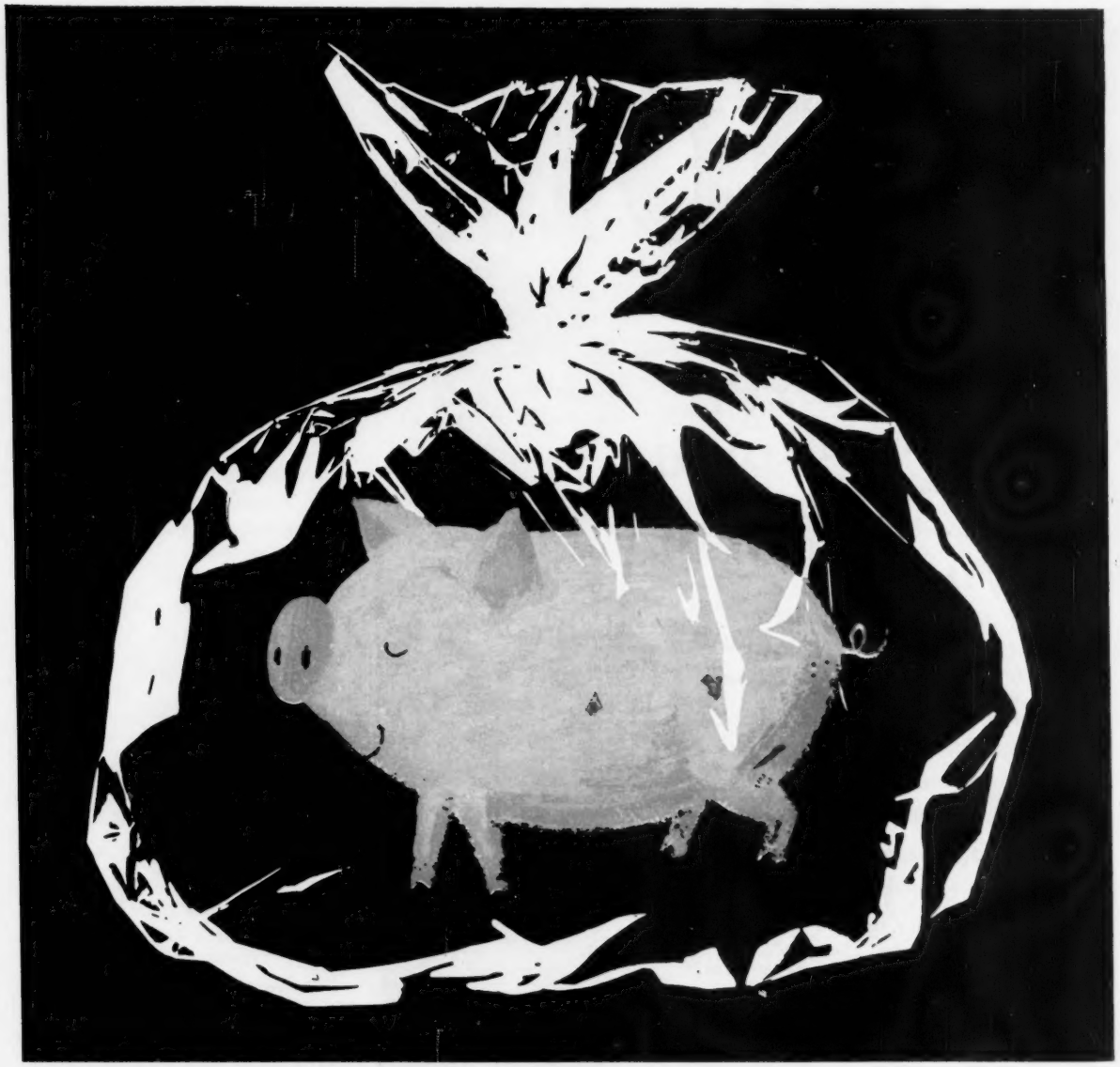

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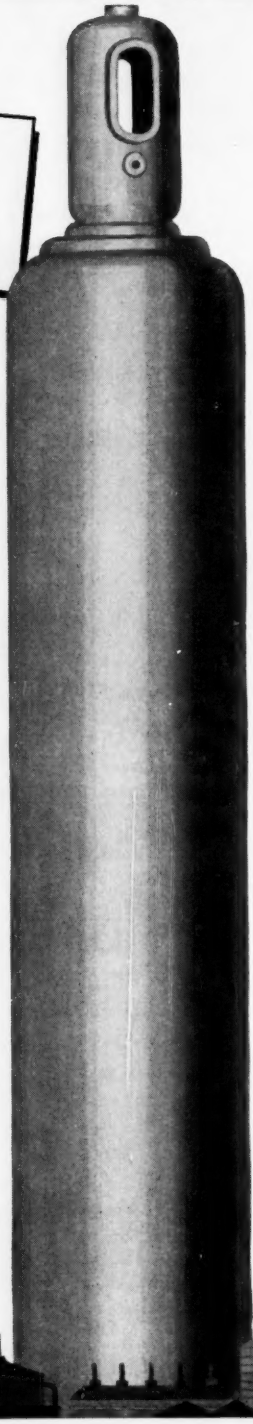

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- Hydrofluoric Acid Aqueous
- Hydrofluosilicic Acid
- Lead Fluoborate
- Metallic Fluoborates
- Potassium Bifluoride
- Potassium Chromium Fluoride
- Potassium Fluoborate
- Potassium Fluoride
- Potassium Titanium Fluoride
- Silico Fluorides
- Sodium Fluoborate
- Tin Fluoborate
- Zinc Fluoborate
- Zinc Fluoride

OPINION

Cancel That Sign!

TO THE EDITOR: So that the Chamber of Commerce staff of Wheeling, W. Va., doesn't have a sign made welcoming G. D. Searle & Co. to its area as its newest industrial citizen, would you point out that the Wheeling where Searle has acquired 130 acres of land is in Illinois about a 20-minute drive from the main laboratories in Skokie?

Searle has no immediate plans for the site. It was purchased in March '56 to hold in reserve for the time when the seams of the Skokie facilities finally burst.

JAMES W. IRWIN
Chicago

Right. In another letter, Searle's president, John G. Searle, points out that the new product mentioned in our Jan. 5 story (p. 23) *is a "hydrocholeretic" (bile improver) rather than a "hydroceletic" (excess-fluid remover).*—ED.

AEC Seeks Help

TO THE EDITOR: I am writing to you to seek your cooperation in a matter that has a direct bearing on the success of the intensified civilian and military nuclear programs of the Atomic Energy Commission.

Like industry, the commission is faced with the problem of a shortage of qualified scientific and technical personnel. The long-run answer to this problem is to secure a greater number of graduate engineers and scientists from the nation's educational institutions. The commission has inaugurated an active effort to provide help and assistance in this respect. Yet, it has a critical need today to augment its current staff.

We are attempting to avoid a "rob Peter to pay Paul" situation in our recruitment as it affects industrial concerns that are engaged in the atomic energy program. We believe there are individuals, however, who would be able to join the commission without impairing the effectiveness of the total program. Although the commission cannot compete with industry in terms of salaries, it can provide valuable experience to such individuals if we are able to acquaint them with the opportunities of commission employment.

You can aid us immeasurably in this endeavor by permitting us to place an advertisement, such as attached, in CHEMICAL WEEK. Such an ad, in accordance with long-standing government policy, would have to be on an unpaid basis. It is hoped that your assistance would be justified by the resulting mutually profitable contacts between your readers and the commission.

GEORGE M. GABLEMAN
Chief, Personnel Operations
U. S. Atomic Energy Commission
Washington, D. C.

Reader Gableman's notice reads as follows: *"Nuclear Engineers. To direct reactor experiments, supporting research and development work, and to evaluate all reactor hazard proposals for the AEC, Washington, D. C. $5,000-$12,000. Requires B.S. in Ch.E., E.E., M.E., Met.E., Aero.E., Physics, with progressive experience in the design, construction, and operation of reactor systems. Contact John E. Uhrlaub, USAEC, Washington, D. C."*—ED.

MEETINGS

American Management Assn.; theme: 1957 labor outlook, midwinter personnel conference; Palmer House, Chicago, Feb. 13-15.

American Pharmaceutical Manufacturers' Assn., Central section meeting, Edgewater Beach Hotel, Chicago, Feb. 11-13; Western section meeting, Ambassador Hotel, Los Angeles, Feb. 18-19.

Technical Assn. of the Pulp and Paper Industry, 42nd annual meeting, Hotel Commodore, New York, Feb. 18-21.

American Institute of Mining, Metallurgical and Petroleum Engineers, Inc., annual meeting, Hotels Roosevelt and Jung, New Orleans, Feb. 24-28.

Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Penn-Sheraton Hotel, Pittsburgh, March 4-8.

National Agricultural Chemicals Assn., spring meeting, Fairmont Hotel, San Francisco, March 6-8.

New York Board of Trade, 31st annual dinner of the Drug, Chemical and Allied Trades Section, Waldorf-Astoria, New York, March 7.

Nuclear Congress International Atomic Exposition, Convention Hall, Philadelphia, March 11-15.

Chemical Market Research Assn.; theme: our next five years of competition with foreign chemical industry; Sheraton Hotel, Philadelphia, March 12-13.

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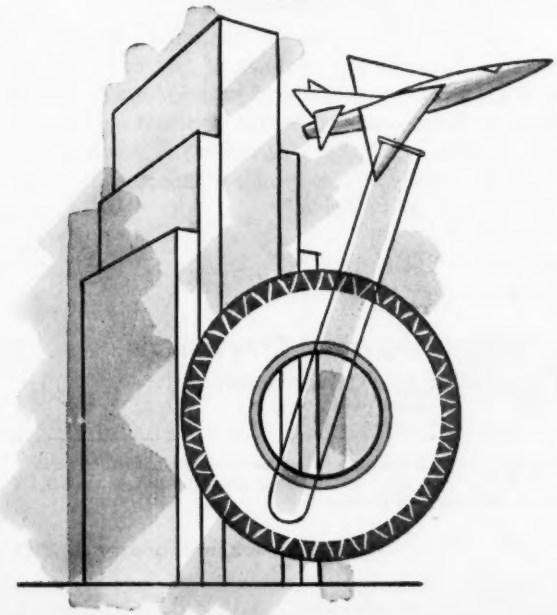

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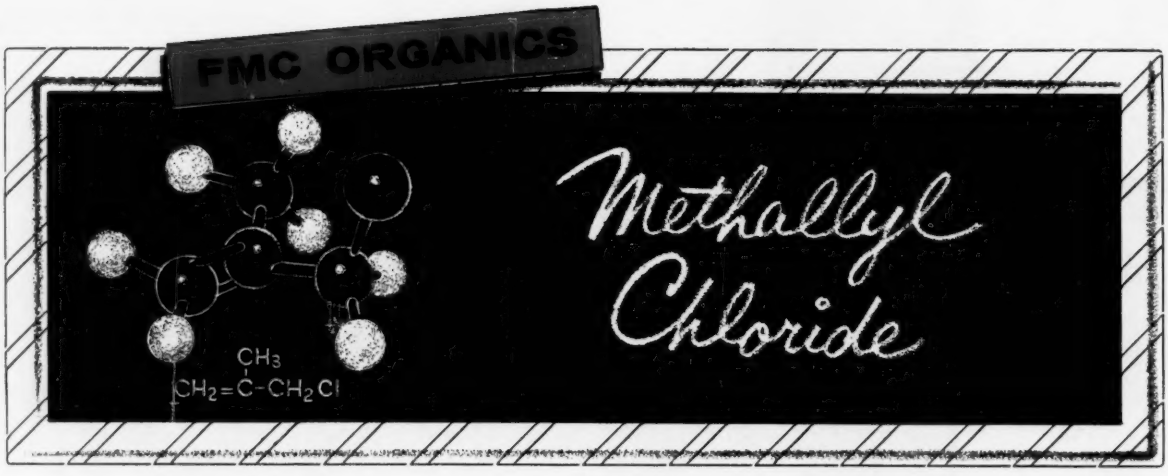

RECENT developments at FMC have brought methallyl chloride from test tube to tonnage within one year. We now offer you this promising compound in commercial quantities at reasonably low cost — not as a chemical curiosity, but as a useful raw material.

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In metathesis reactions chlorine is readily replaced to form methallyl alcohol, methallyl ethers, esters, amines and other characteristic allylic derivatives. In reactions involving the double bond, the tertiary carbon atom increases the susceptibility of the double bond to halogenation, sulfonation, nitration, hydrohalogenation, halohydrination and oxidation. This enhanced double-bond activity is a characteristic of the methallyl derivatives generally. The double bond is also active in polymerization reactions.

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Production samples of methallyl chloride, as well as development samples of methallyl alcohol and acetate, are immediately available. We will be glad to discuss your interest in these compounds or in other methallyl derivatives. Upon request, we'll also send you a copy of our informative bulletin "Methallyl Chloride."

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Here are more financial report highlights:

Hercules Powder's year-end figures told stockholders of an all-time record high in sales—nearly $236 million, 4% more than last year. Net income slumped, however, to $17.7 million from $19 million, a drop of 7%.

Union Carbide also set a sales record—$1.3 billion, up 8% over '55. The report included sales of Visking Corp., UCC's recent acquisition. Net profit also rose, but only slightly—to $146.2 million from 55's $145.8 million.

In a six-month report, Spencer Chemical showed sales of $18.7 million, up 7% over the same period of '55. But net profit tumbled about 5% from the mark of the previous year, to $1.5 million.

Another six-month report, by International Minerals & Chemical, showed sales in the last half of '56 to be almost $42 million, 11% over the same period in '55. Net earnings rose to $1.8 million, 300% over the $445,000 earned in the last half of '55. (The figures for '55 took into account the long Florida phosphate strike, however.)

•

National Gypsum Co. will get its building permit for a $6-million gypsum plant in Lorain, O. (*CW, Jan. 9, p. 23*), but it will operate under strict, newly enacted smoke and air pollution laws. Gypsum proved that a gypsum plant needn't be a pollution nuisance—the company flew Lorain City officials to Burlington, N. J., to show how it licked pollution at its plant there. Lorain officials, impressed by the firm's job of pollution control—and by its good community relations there—agreed that the company could go ahead and build at Lorain.

Firestone Tire and Esso Standard Oil are building good will in their overseas operations. They're among nine American firms providing free Salk vaccine inoculations to children in plant communities overseas.

More than 20,000 children have been inoculated under the program so far. Virtually all native children in the communities are eligible for the full, three-shot treatment, whether or not their parents are company employees. Limitations so far have been largely those imposed by the amount of vaccine included in the U. S. export quota—7.5 million cc. for the current quarter.

•

Cold weather plus frozen streams add up to reduced power available to industrial users in the Pacific Northwest. Kaiser Aluminum & Chemical had to shut down three of its eight aluminum potlines in Mead, Wash., last week because reduced stream flow forced curtailment of interruptible power.

Business
Newsletter

(Continued)

A privately owned company was ordered to fluoridate its water supply by the California Public Utilities Commission last week. The company, California Water Service, had been told to fluoridate its water in 1954 by the Oroville City council and the Butte county board of supervisors, after a public hearing on the matter. The company refused, saying it could take such action only after a vote of its customers. The city and county then filed a joint suit with the state PUC; some 22 other organizations filed a similar complaint later. The PUC action is thought to be the first decision of this kind by a state regulatory body.

•

National Distillers and Mallory-Sharon Titanium Corp. are pooling money and know-how to form a new company to manufacture products of zirconium. The new firm, Reactive Metals, Inc., will have its plant at Ashtabula, O., near Distillers' zirconium sponge plant. Capacity of the plant will be great enough to absorb the latter's sponge output. First, it will make ingots and similar mill products.

•

A chemical union showed one way of dealing with racketeers within its organization. International Chemical Workers Union provided the example: When one of the officers of ICWU's Local 587 (Staten Island, N. Y.) had been shown by a Senate committee investigation to be a member of a union that had once been expelled from AFL for extortion (*CW, Feb. 2, p. 36*), ICWU President Walter Mitchell immediately ordered the local's officers suspended, put a supervisor in charge of the local.

Mitchell's action was unusually swift. The name of the officer had been uncovered a few weeks ago by the Senate committee (he was not at that time thought to be involved in any ICWU activity), but when ICWU checked records, it found his name among officers of Local 587, which represents some 25-50 workers at Delaware Chemicals.

The union, still checking other names turned up by the Senators, says it will act as swiftly in other cases. For help in locating racketeers, it will have to depend on such probes as that of the Senate's, since it has no subpoena power and no trained investigators to locate racketeers.

•

Not everyone's happy about the Stauffer-West End merger. Last week, John Gallois, sole dissenter at last year's merger meeting (*CW, Oct. 6, '56, p. 26*), and holder of 58,712 shares of West End's preferred stock, invoked a seldom-used section of California's corporation code to have three impartial appraisers determine a "fair market value" of his shares. Stauffer had offered him $1.05/share; Gallois says each is worth $200, although there are indications he might settle for $5.80/share. It is Gallois' view that the boron deposits at Searles Lake haven't been evaluated in recent years, and that they are worth a total far greater than current book values.

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how much do you know about this valuable building block of industry?

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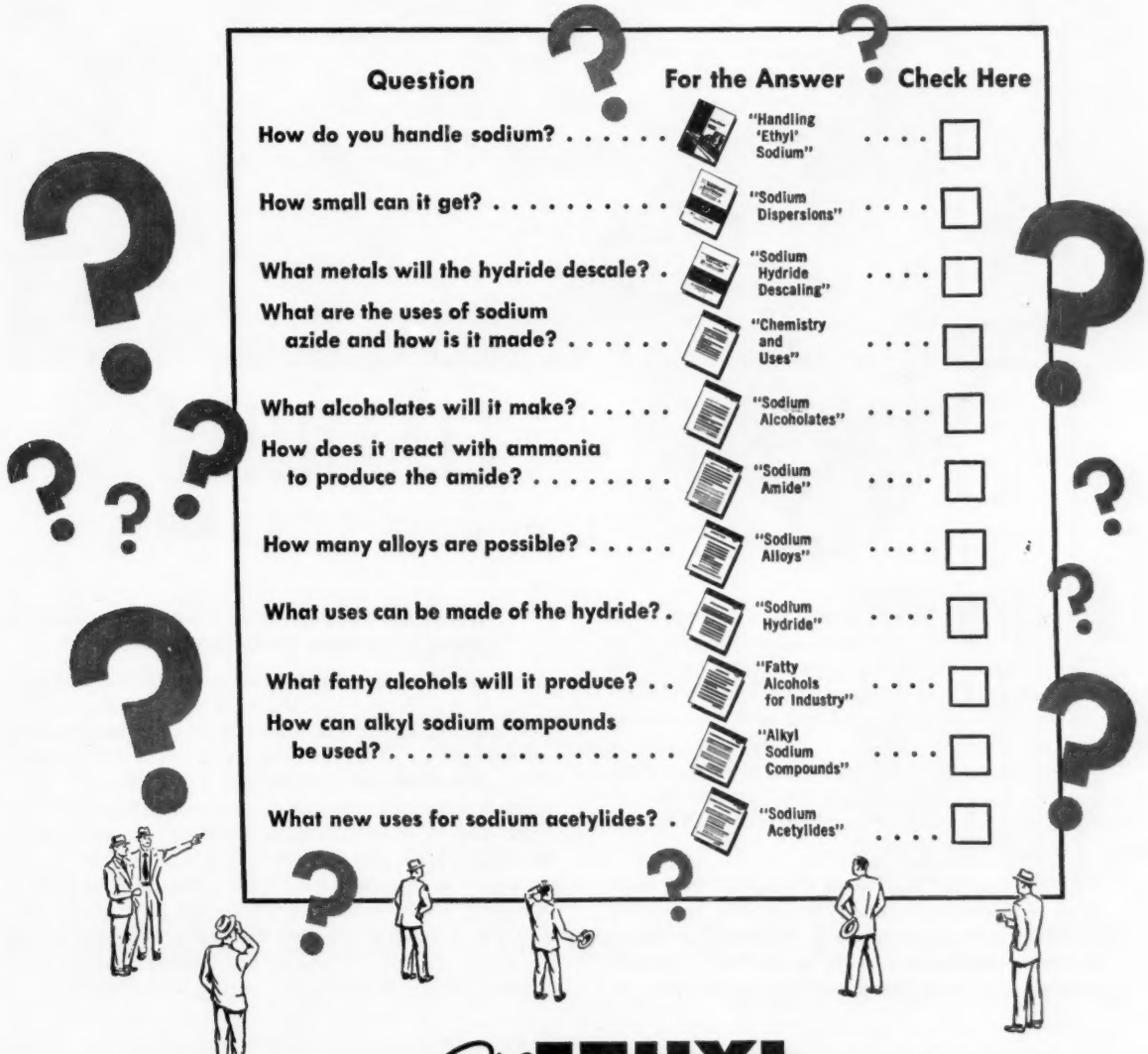
We suggest you check the items that are not in your library. Cut out the question box below, clip it to your letterhead, mail it to Ethyl Corporation, 100 Park Avenue, New York. We'll send you copies promptly.



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How do you handle sodium?	"Handling 'Ethyl' Sodium"	☐
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What metals will the hydride descale?	"Sodium Hydride Descaling"	☐
What are the uses of sodium azide and how is it made?	"Chemistry and Uses"	☐
What alcoholates will it make?	"Sodium Alcoholates"	☐
How does it react with ammonia to produce the amide?	"Sodium Amide"	☐
How many alloys are possible?	"Sodium Alloys"	☐
What uses can be made of the hydride?	"Sodium Hydride"	☐
What fatty alcohols will it produce?	"Fatty Alcohols for Industry"	☐
How can alkyl sodium compounds be used?	"Alkyl Sodium Compounds"	☐
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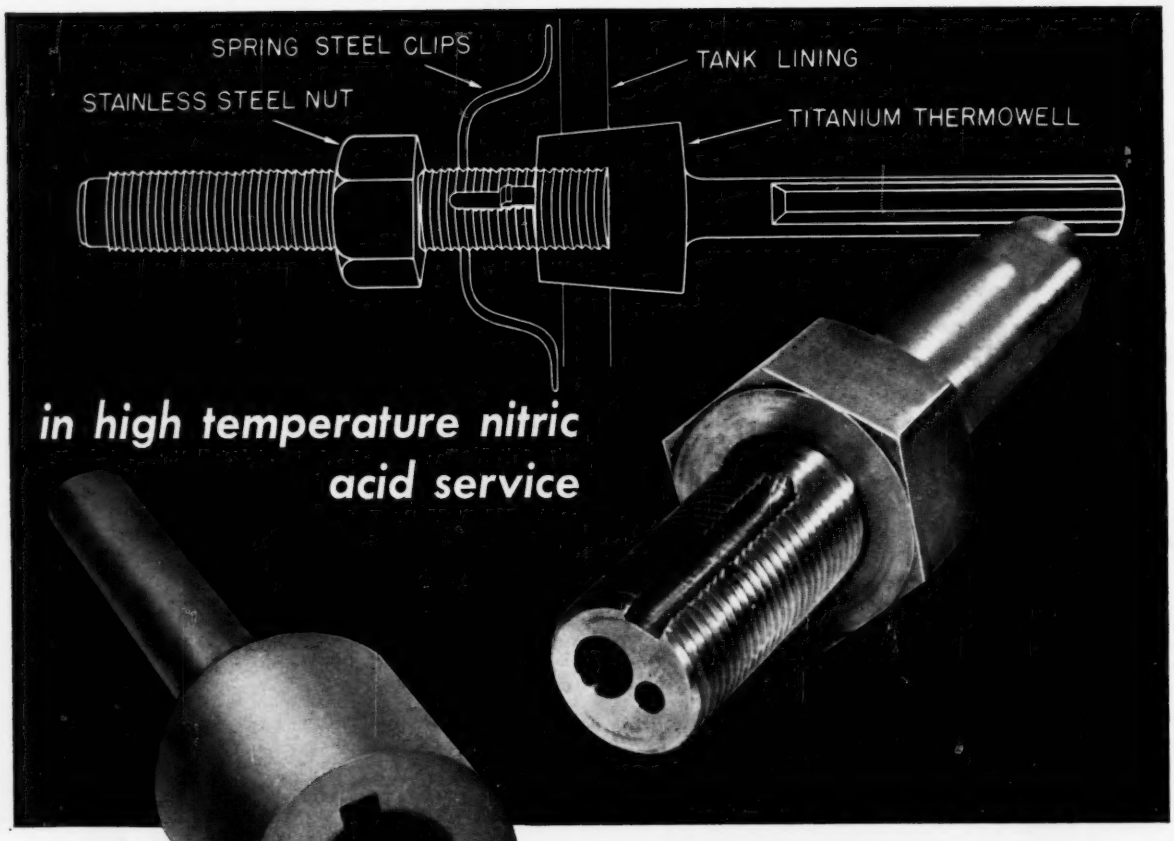

TITANIUM
thermowell SAVES $10,000

A thermowell, used in a chemical reaction vessel at DuPont, was failing about every nine months from severe corrosion, even when fabricated from one of the best of the standard corrosion-resistant metals. The environment was dilute nitric acid and nitrogen oxide at temperatures exceeding 400F.

Titanium was suggested as a material of construction. But, since such a unit would cost $300 against $95 for the existing installation, a careful total cost analysis was made. The findings were startling:

DuPont corrosion engineers discovered that each time a thermowell failed, it cost the company $1500 in lost production and replacement labor. They estimated a service life for the titanium thermowell of at least five years (five to ten times as long as the other corrosion resistant material) resulting in a saving of about $10,000.

As this case history shows, titanium's corrosion-resistance often makes it by far the most economical material. Yet, this versatile metal offers additional outstanding advantages . . . each sufficiently important to recommend it to designers and engineers. For example, titanium is unusually resistant to erosion by high-velocity fluids and to stress-corrosion cracking . . . withstands abrasion, shock and fatigue . . . has a uniquely high strength-weight ratio that means substantial reduction in weight and cost of material needed for a given use.

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- **Top AFL-CIO leaders press for craft-industrial union mergers . . .**

President George Meany is trying to settle basic craft-industrial fights, but, so far, his efforts have failed.

Organizing chief Jack Livingston thinks large companies should be organized by one union, on a plant-by-plant basis.

Vice-President Walter Reuther asks CIO groups to protest actions of AFL at state level.

- **While chemical unions, eager to grow, are hampered by disputes . . .**

OCAW President (Jack) Knight sees organizing 'the toughest in years,' but can't agree with ICWU over jurisdiction.

OCAW Vice-President Elwood Swisher hopes for union progress, claims 1,700 new members, winning 27 of 50 recent NLRB elections.

- **As outsiders snipe at their jurisdictions.**

Building Trades President Richard Gray cites OCAW as one of marauding unions invading construction jobs traditionally belonging to craft unions, fights contracts that keep his men off jobs.

Chemical Union Merger May Come in '57

A strong new effort is being made to merge the two rival AFL-CIO chemical unions—the International Chemical Workers Union and the Oil, Chemical & Atomic Workers. Such a merger, which may come this year, would spark a major organizing drive in nonunionized plants of the larger chemical companies.

In Miami last week, leaders of the two unions held preliminary talks on the chances of a speedy merger—the first such talks held since the change in the top leadership of the Chemical Workers. And though leaders, speaking to a *CW* reporter who covered the midwinter session of the AFL-CIO Executive Council, emphasized that the talks were just "exploratory," mounting pressure from outside unions may well force the hands of both chemical unions. The talks in Miami gave rise to hopes that a merger will be worked out—possibly before the end of '57. There's a growing concern among leaders of the

unions that unless they can arrange a merger—or at least come to some agreement over the question of who should have the chance to organize which plant, building trades unions, textile unions, the Teamsters and others may try to move in on the chemical union jurisdiction.

No Agreement: So far, the rival chemical unions have been unable to agree on how to divide the unorganized territory. Under the plan of AFL-CIO organizing director Jack Livingston, all the plants of a single firm would be organized by one union—on a plant-by-plant basis. But neither chemical union is willing to turn over such territory to the other.

But, unless agreement is reached soon, there's a possibility that one or the other of the chemical unions may take the lead and start a big organizing drive on its own.

Twenty to Two: OCAW's current organizing program is still moving along. Of the 22 chemical plants that were its original targets, one has been organized and an election is due in another. And, according to OCAW Vice-President Elwood Swisher, his union has won 27 out of 50 National Labor Relations Board elections since last September, has brought in 1,700 new members.

But generally, organizing is tough—"the toughest in years," says O. A. (Jack) Knight, OCAW president. Until an agreement with International Chemical Workers Union materializes, no big gains will be made.

Treading on Toes: While trying to develop an amicable working relationship with ICWU, Knight's OCAW ran into trouble with the AFL-CIO Building Trades Dept. which was already scrapping with several ex-CIO industrial unions over jurisdiction on construction in industrial plants.

OCAW was cited, along with the big steel and auto unions, by Building Trades President Richard J. Gray as unions that are invading construction activities that traditionally have belonged to the craft unions. According to Gray, the industrial unions are promoting a campaign to write in so-called no-contracting-out clauses in their contracts. (The main aims of no-contracting-out agreements are to keep maintenance work and other associated projects for the union members, and to insist that no work be contracted for with any other union at times when chemical union members are idle.)

Both Knight and Swisher deny that there's a new drive to take work away from other unions, but both concede that OCAW insists on such clauses in oil and chemical contract negotiations. They concede the principle, however, that any new plant construction be handled by the building trades unions.

Stealing Jobs: The craft unions, in a plea to AFL-CIO President George Meany, argued that this chemical union policy is taking jobs away from their members. Swisher says, however, that in the atomic field, particularly, basic construction projects are being completed and craft workers are losing out largely because there is no more work for them.

Meany's plan to have these basic craft-industrial disputes arbitrated was rejected by the building trades group.

The building trades unions carried their fight into the atomic energy field with an attack on the industrial union's position on atomic safety. Gray asked the AFL-CIO Council to rescind its support of United Auto Workers and other unions that are seeking to halt construction of Power Reactor Development Corp.'s atomic energy reactor in Monroe County, Michigan.

In a letter to Meany, Gray said the building trades groups had been advised that there is "doubt [that] lives would be endangered in any manner and form" and urged that support for construction of the reactor be given.

State-Level Troubles: The top-level AFL-CIO troubles were also reflected at the state level at the council sessions. At the call of UAW President Walter Reuther, groups of former CIO men from a half-dozen key states, including New York, New Jersey, Michigan and Ohio, made a protest to the action of AFL officials in those states. The ex-CIO officials complained that former AFL state leaders were insisting on the two top jobs in any merger of AFL and CIO state councils, no matter what the ratio of former CIO and AFL union members in a particular state.

Reuther carried these complaints to the executive council, which may develop a set of ground rules for state mergers. The pressure on these groups will increase; if they aren't merged by the end of the year, the AFL-CIO leadership takes over both organizations.

WIDE WORLD

JUDGE KNOUS: He sent the case to the jury, but no decision came back.

Vanadium Suits Face More Delay

A $1.5-million-treble-damage suit brought against Union Carbide and Carbon Corp. and Vanadium Corp. of America in 1949 may not be able to come to trial for some time, now that a federal court jury has failed to reach a verdict on antitrust charges against the two firms (*CW Business Newsletter, Feb. 2*).

Results of this antitrust trial were expected to bear significantly on the damage suit filed by Continental Ore Co. (New York), which seeks damages from the companies for allegedly restraining Continental from entering the vanadium processing business in the 1930s. Continental had purchased an old vanadium mill at Gateway, Colo., to process the material. But Henry Leir, Continental president, says he was unable to buy vanadium supplies from UCC, its subsidiaries, and from Vanadium Corp.

Antitrust Retrial: But charges by the U. S. Justice Dept. that UCC and Vanadium had conspired to monopolize the vanadium industry and to fix prices between 1933 and 1946 remained unproved, since the Denver jury was unable to reach a decision.

Numerous briefs have been filed in the Continental-UCC-VCA suit, which had been scheduled for trial

Feb. 4. However, by mutual agreement between the companies, trial has been reset for March 18. Continental, which has been hoping for a decision adverse to the two defendants, in the government suit, will probably want to sit out the new trial —though it's not commenting publicly.

Testimony: Apparently, the Colorado jury of nine men and three women could find nothing in testimony presented by the government and the defendants on which it could base a decision about the alleged conspiracy between UCC and VCA.

Government attorney Raymond Carlson sought to prove the charges by testimony of "documented talks" between officials of the defendant companies. He declared that Union Carbide, through its subsidiaries, sold millions of dollars worth of vanadium to Vanadium Corp., and in return, was allowed to sell a major share of U. S. vanadium exports.

One of the first government witnesses in the trial was Robert Knittle, an accountant and former FBI agent, who testified that an exhaustive check of the firms' records for the 1933-45 period showed that Vanadium sold approximately two-thirds of all ferrovanadium and vanadium oxide in the U. S. during the time. He said this was even during a period when the firm had no source of its own ore.

He also testified that from 1933 to 1940, company records showed UCC and its subsidiaries sold vanadium oxide to VCA for 80¢/lb., when the prevailing rate on other sales ranged between $1.05 and $1.10/lb.

Defense: In answer to the charges, defense attorney Morrison Shafroth argued that the government had produced no proof that a single competing vanadium mill was eliminated through actions of the companies. Moreover, he contended it was good business for UCC to sell ore to Vanadium Corp., because UCC had experienced previous selling difficulties. Even though UCC reduced its price 30¢/lb. to VCA, Shafroth insisted, it realized 20¢/lb. profit.

After the government had rested its case, the defense moved for a directed verdict of acquittal, but District Judge Lee Knous ruled there was enough evidence to warrant sending the case to the jury.

MCA'S FIGURES ON 1956-58 CHEMICAL EXPANSION
(million dollars)

Category	Completed	Under Construction	Planned	Total
Fertilizer chemicals	201.9	130.4	74.5	406.9
Inorganic chemicals	206.7	361.5	247.9	816.0
Organic chemicals	310.5	367.0	184.6	862.0
Metals	131.0	288.7	46.0	465.7
Petroleum- and gas-derived chemicals	29.1	18.1	48.5	95.6
Plastics and resins	124.2	245.7	24.7	394.7
Rubber	23.8	156.3	30.0	210.1
Textile fibers	75.7	177.0	26.2	278.9
Miscellaneous	16.0	———	20.0	36.0
Laboratories	42.5	37.3	15.7	95.4
Total	1,161.2	1,781.9	718.0	3,661.1

Industry Keeps on Building

The chemical process industry's expansion for the next two years will total $2.5 billion. That's the word from the Manufacturing Chemists' Assn., whose annual survey was out this week. Too, during 1956, construction projects worth $1.2 billion were completed. The value is half again as large as that for plants completed during '55 (*CW, Feb. 4, '56, p. 23*).

The survey covered 760 projects, of which 354 were completed in 1956. Some 278 projects currently being built will cost an estimated $1.8 billion, and another 128 projects definitely blueprinted will cost an estimated $718 million.

Far and Wide: The survey shows the South and Southwest, Far West and Middle West predominate in chemical process expansion.

Texas, which ranks third among states as a chemical producer, led in the number of expansions included in the survey, with 81 projects costing an estimated $640 million completed last year, under way or definitely scheduled.

Louisiana, which last year ranked below the top three, moved into second place on the '56-'58 basis. Altogether, it has 39 projects listed in the three categories, with a total value of $378.6 million. California, second last year, slipped to third place, with 65 projects valued at $245.5 million.

The top 10 states in total expansion figures represented about 68% of the total expansion values for all states.

Division Totals: Consolidation of figures for completed, under construction and planned expansion shows that in 1956 the industry made its heaviest commitment, $862 million, in organic chemicals. Second largest commitment

was $816 million, for inorganic chemicals. Some $465 million was allocated for chemically produced metals or metallic compounds, exclusive of aluminum, processed uranium, copper and ferroalloys.

The MCA figures are not comparable to those on capital spending compiled by the Securities & Exchange Commission and Commerce Dept., or to those by the McGraw-Hill Dept. of Economics, since both of these include everything spent during a year—not just the value of completed plants.

Thus, MCA gets its 1956 figure of $1.1 billion of construction completed, contrasted with the other figures of approximately $1.5 billion, for total '56 construction spending. Another difference: while other figures categorize spending by the principal business of the company involved, MCA has attempted to list every chemical project, no matter by whom it is built.

Southwest Record: The $640.0 million Texas total includes completed chemical construction projects valued at $154.6 million. In the next two years, plants worth another $485.3 million will likely go into operation.

Broken down into product categories, the state total shows spending of $251.1 million for organic chemicals, $137.2 million for synthetic rubber, $121.4 million for plastics and resins, $70 million for chemically processed metals, and $34.5 million for inorganic chemicals.

Second-ranking Louisiana's expansion includes spending of $119.8 million for chemically processed metals, $99 million for inorganic chemicals, $92.1 million for organic chemicals, $28.4 million for plastics and resins, $20.8 million for fertilizer chemicals, and $14.7 million for synthetic rubber.

Ten Top States

(Total expansion completed, planned, and under construction, in million dollars.)

1.	Texas	$640.0
2.	Louisiana	378.7
3.	California	245.5
4.	Florida	237.9
5.	West Virginia	229.5
6.	Ohio	226.9
7.	Tennessee	145.8
8.	Michigan	141.4
9.	New Jersey	139.1
10.	Pennsylvania	115.3

Fight Flares on Gas Supply

Chemical management in Arkansas is caught up in a swirl of confusing events in a fight over natural gas rates charged to industrial users.

Latest move in the series was by Magnet Cove Barium Corp. It has withdrawn from a joint appeal to the Arkansas supreme court that protested a gas rate hike authorized in 1955 by the state public service commission (*CW Business Newsletter, Feb. 2*). Instead of appealing, Magnet Cove has joined several other companies by signing a "Three-X" contract with Arkansas Louisiana Gas Co., providing it with a virtually uninterruptible gas supply—at a price 5¢/1,000 cu. ft. higher than that paid under standard contracts.

REYNOLDS: Without guarantees, there'll be no expansion.

The switch aligns Magnet Cove with Reynolds Metals and Arkansas Power & Light Co. in the camp of 3-X signers. As a result, bitter complaints have been made against Ark-La by Aluminum Co. of America.

Alcoa, in a complaint filed with Arkansas PSC in December, charged "discrimination" against it by Ark-La, and also declared that the 3-X preferential service contract signed by Reynolds Metals with Ark-La provides Reynolds with natural gas on terms unfair to other large users who have no such contracts. Reynolds and Alcoa both have large-scale bauxite ore mining, alumina production and aluminum plants at Bauxite, Ark.

The Beginnings: It all began in '55, when PSC authorized a $4.3-million increase in annual rates charged to 34 of Ark-La's industrial customers. The increase—from 14¢/mcf. to 18¢/mcf.—stemmed from adoption by PSC of the "fair field" theory of pricing, which ties the sale price of gas produced by Ark-La to the buying price of gas purchased by Ark-La for distribution.

This decision, appealed by many customers shortly after the boost was granted, is now before the Arkansas supreme court. This is the appeal from which Magnet Cove has withdrawn, along with Reynolds Metals and Arkansas Power—each of which has signed a long-term 3-X contract. Other companies still appealing include Alcoa, National Lead, Columbian Carbon, International Paper, Monsanto, two brick companies and the federal government (which purchases gas for Army Chemical Corps installations at Pine Bluff, Ark.).

Meanwhile, Alcoa filed its complaint with PSC in Dec. '56, and sought an injunction in chancery court to require Ark-La to give it the same kind of service Reynolds got under the 3-X contract. The injunction was denied—after Reynolds intervened in court. Now, all 3-X contracts have been suspended by PSC, which has scheduled further hearings for April.

Topping it all off, Reynolds' J. Louis Reynolds, Jr., says his firm won't go ahead with a proposed expansion of its facilities in Arkansas unless it can get guarantees from Ark-La covering firm gas supplies for the next 20-30 years. Ark-La says it has neither reserves nor inclination to make such promises.

COMPANIES

American Potash & Chemical Corp. has acquired National Northern Corp., Westover, Mass., in a cash transaction. National Northern, a division of National Fireworks Ordnance Corp., will be operated as a wholly owned subsidiary of Ampot.

•

Aluminum Co. of America directors plan to boost Alcoa's authorized

Washington Angles »

» Senate determination to press investigations became evident in the Democratic-controlled legislature last week with approval, only slightly trimmed, of committee requests for money. The Senate allowed $2.8 million for a baker's-dozen committee probes.

Among major recipients: Senator McClellan's (D., Ark.) special labor rackets committee, given $350,000, with more likely later; Senator Kefauver's (D., Tenn.), Antimonopoly subcommittee, $225,000; Senator Magnuson's (D., Wash.) Commerce Committee, $275,000, including $50,000 to probe gasoline and oil price hikes; and Senator O'Mahoney's (D., Wyo.) Patents subcommittee, $80,000.

» A broad, basic study of drought and other soil and water use problems—with more emphasis on the role of lime and fertilizer—was urged this week by a special advisory committee set up by the U.S. Dept. of Agriculture.

The group wants USDA researchers to probe the reaction of lime on soils and the effects of liming on availability of nutrients to plants.

Also recommended: an expansion of the government's role in efforts to improve control of fertilizer quality; a start on research on low-solubility potassium fertilizers.

» Details of Taft-Hartley law revisions to be sought from Congress will likely be unveiled by the White House sometime in March.

Labor Secretary Mitchell says he's shooting for about Feb. 15 to get his department's proposals to the Cabinet, promises that a formal request to both houses of Congress for enactment will come from the President within a "reasonable time" thereafter.

While refusing to disclose proposals in advance, Mitchell is firm on one issue that won't be touched: "I will not recommend any change" in T-H's controversial section 14 (b)—permitting states to adopt 'right to work' laws.

» Antitrust review of private atomic industry has been promised by Attorney General Brownell, though there's no indication that he has any specific antitrust action brewing.

In fact, Brownell, in a speech delivered recently to a New York State Bar Assn. meeting, points out that in the infant industry, problems concerning competition have not yet been serious.

Nevertheless, he says, his department is keeping a close watch on developments and is ready to take any steps necessary to maintain free competition in atomic energy.

» Hopes for a greater supply of skilled labor in the coming decade are doomed to disappointment.

That's the gist of a new report by the Bureau of Labor Statistics. While it predicts a rise of 10 million in the nation's labor force by 1965, nearly all the increase will be in young, inexperienced workers, women and the over-45-years-old group.

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common stock from 25 million shares to 50 million. Stockholders will vote on the proposal at the company's annual meeting in April. Alcoa says it has no immediate plans to sell or otherwise issue the shares.

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Ferro Corp. has acquired American Clay Forming Co. (Tyler, Tex.), ceramics manufacturer, through an exchange of stock. The purchase, effective Feb. 1, cost Ferro slightly less than $1 million.

•

Aluminium Ltd. is planning a 3-for-1 split of its common stock. Stockholders will vote on the split on April 25. U.S. investors hold about 75% of the firm's outstanding shares.

•

Anaconda Co. has registered a 1,734,865-share common stock offering with the Securities & Exchange Commission. Stockholders will be able to buy one share for each five held of record Feb. 14.

Dayton Rubber Co. (Dayton, O.) will market $5 million worth of subordinated convertible debentures.

EXPANSION

Alum: Allied's General Chemical Div. will build a $250,000 liquid ammonium sulfate plant at Port St. Joe on Florida's west coast. Most of the plant's output is slated for paper manufacturers in the area who use it as a major processing material. Construction got under way last week, will be completed about July 1.

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Glass Fibers: Pittsburgh Plate Glass Co. plans a $20-million glass fiber plant at Shelby, N. C. About 2 years will be required to complete engineering and construction.

•

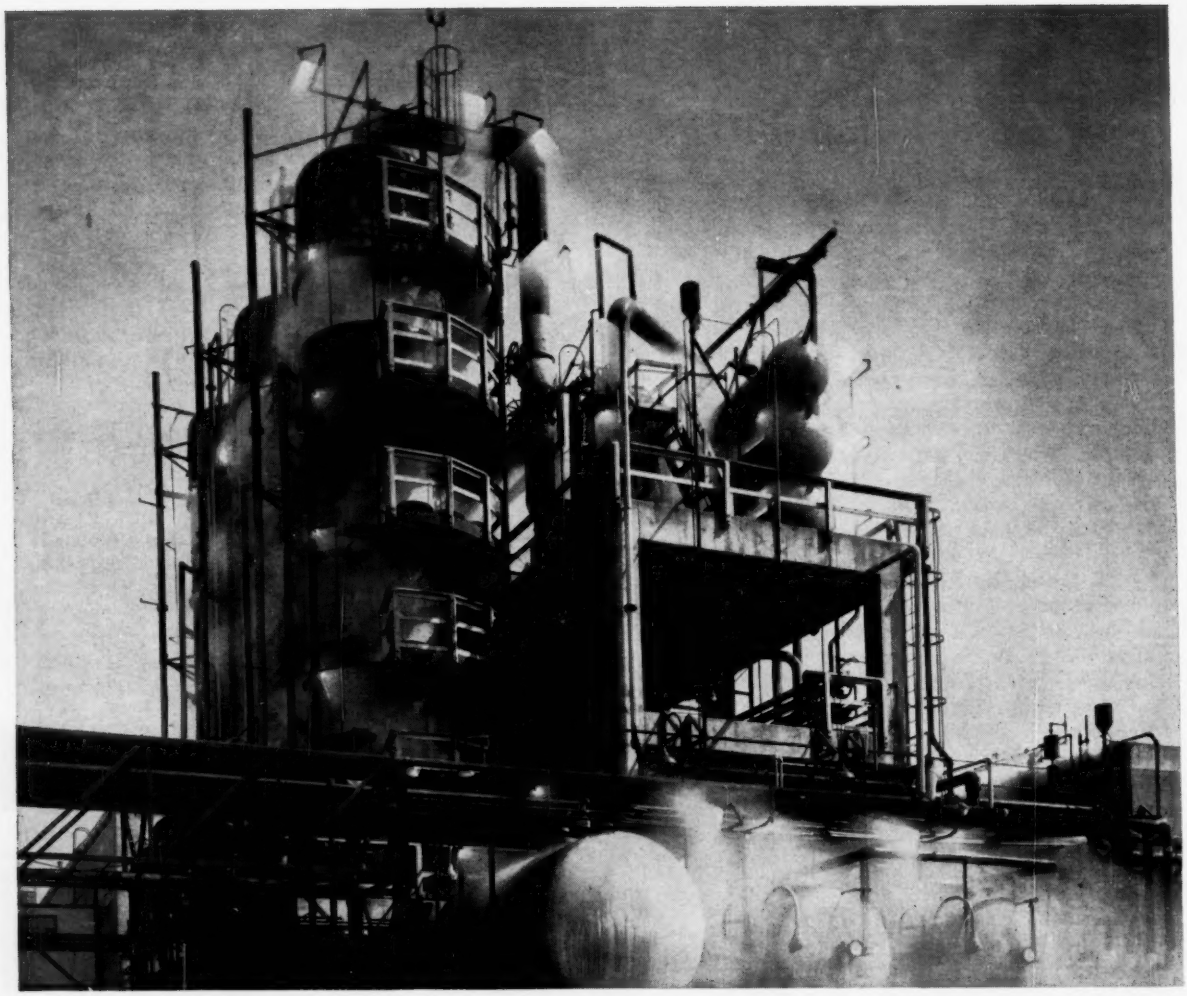
Eastman Kodak Co. has set aside $53.5 million this year to expand and modernize its plants in Kingsport, Tenn., Rochester, N. Y. and Longview, Texas. The Tennessee and Texas plants will get about $21 million; Rochester, $32.5 million. Eastman will spend about $6.5 million on other sales and processing units in the United States.

•

Hydrogen: Girdler Co. (Louisville) has begun engineering a hydrogen unit for U.S. Steel's Clairton, Pa., complex (*CW, Sept. 8, '56, p. 115*). The new plant, which will use Koppers' pressure catalytic refining process, should be in operation by late '57.

FOREIGN

Polystyrene/Japan: Monsanto Chemical Co. and the Japanese firm of Mitsubishi Kase Kogyo have completed construction of a jointly owned polystyrene plant near Nagoya. The new unit, first of its kind in Japan, has a capacity of 250 tons/month of polystyrene. Cost: $694,000.



"Automatic" Sprinkler FIRE-FOG System provides PRODUCTION PROTECTION in case of fire

● This photograph shows the testing of an "Automatic" Sprinkler FIRE-FOG system, installed on a typical chemical process structure. The purpose of this system is not to extinguish the fire, *but to protect the structure from damage* while the unit is being purged of flammable liquids. Thus, the system protects the thing most important to the owner —which is not the loss of valuable equipment, but the loss of production when the structure or process equipment is seriously damaged.

For example, a recent fire in a similar, but unprotected, plant caused $250,000 damage. It was back on stream in 30 days, the production loss estimated at $120,000. While serious, this loss was not enough to materially affect the annual financial statement of a billion dollar corporation.

However, leaks and vessel defects caused by the fire showed up later, necessitating a complete overhaul and rebuilding of the structure at a cost of $1,000,000. This time the plant was down for 11 months, and the lost production amounted to over $13,000,000 — enough to make the difference between an annual profit or loss of even the largest corporation!

"Automatic" Sprinkler specializes in special hazard fire protection problems. For more information, write for Bulletin 73, "Special Hazard Fire Protection"—or call your nearest "Automatic" Sprinkler district office.

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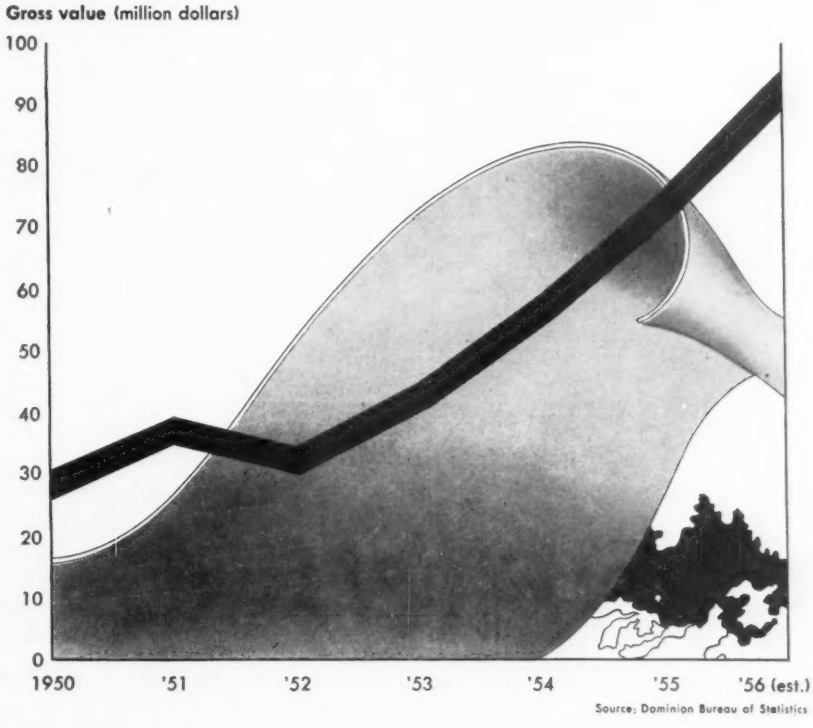
Charting Business

CHEMICAL WEEK
February 9, 1957

Canadian Primary Plastic Industry Surges Ahead . . .



. . . and these chemicals ride the crest of the wave.

(est. '56 consumption)

Acetic anhydride	**100,000 lbs.**	**Glycerine**	**3,750,000 lbs.**
Acids: hydrochloric, sulfuric 100%	**35,000,000 lbs.**	**Pentaerythritol**	**1,500,000 lbs.**
Alcohol: ethyl, methyl	**1,200,000 gals.**	**Phenol**	**25,000,000 lbs.**
Benzene	**10,000,000 lbs.**	**Phthalic anhydride**	**7,000,000 lbs.**
Cresol	**700,000 lbs.**	**Sodium hydroxide**	**21,000,000 lbs.**
Formaldehyde	**50,000,000 lbs.**	**Urea crystals**	**7,500,000 lbs.**

OUTSTANDING feature of Canada's primary plastics industry has been its rapid expansion. In 1950, gross production value of primary plastics was estimated at $30 million; last year, value was $96 million. And by 1975, it's likely to hit $400 million, impelled by current heavy investments in plant facilities and equipment.

And paralleling this bullish growth has been the industry's consumption of chemicals—250 million lbs. last year.

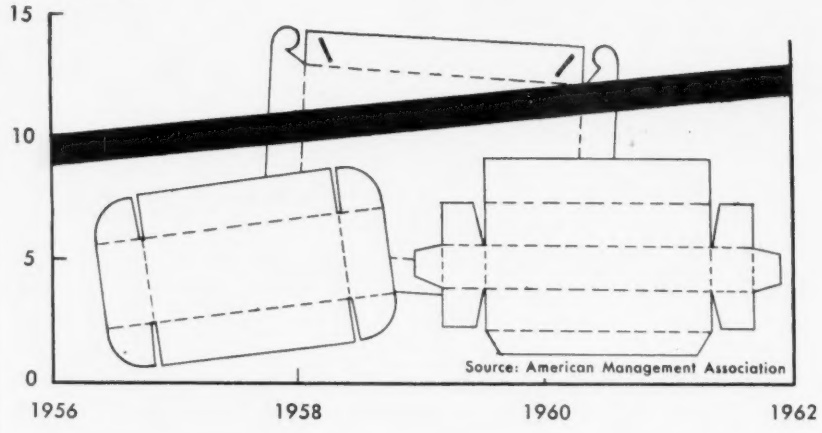
Charting Business

(Continued)

Packaging: Giant Consumer Of Chemicals...

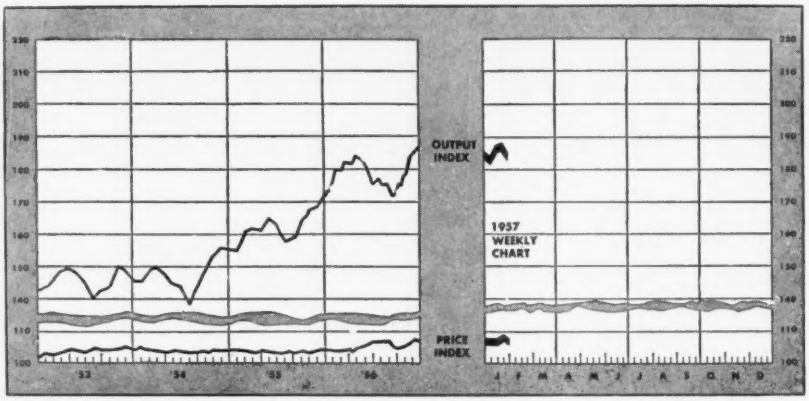
Packaging Sales
(billion dollars)

A $13-billion industry by 1962.



BY 1962, the packaging industry will have increased production 30% over today's level; the nation's annual packaging bill will jump $3 billion, to $13 billion, boosting packaging's share of gross national product to 3% (it's now 2.5%). Packaging absorbs 99% of total domestic cellophane production; 80% of all metal foil (equal to 7% of the aluminum industry's entire output); 70% of all nonflat glass; 55% of total paper and paperboard production. Last year alone, U.S. manufacturers used over 250 billion units of packages and cartons.

Business Indicators



WEEKLY	Latest Week	Preceding Week	Year Ago
Chemical Week Output Index (1947-49=100)	184.1	185.5	180.5
Chemical Week Wholesale Price Index (1947=100)	108.4	108.2	105.5
Stock Price Index of 11 Chemical Companies (Standard & Poor's Corp.)	413.1	415.0	462.3

MONTHLY

Foreign Trade (million dollars)	Exports			Imports		
	Latest Month	Preceding Month	Year Ago	Latest Month	Preceding Month	Year Ago
Chemicals, total	86.2	99.8	93.0	25.3	22.1	21.3
Coal-tar products	5.0	6.1	6.0	6.1	4.4	4.1
Industrial chemicals	14.5	14.6	14.0	6.2	7.6	7.0

A new name in the chemical industry

AM

Products of AMOCO Chemicals

- **From Indoil Chemical Company**

  Isooctyl and Decyl Alcohols, Detergent Alkylate, Polybutenes, Rubber Plasticizers, Alkanesulfonic Acids and Benzene.

- **From Pan American Chemicals Corporation**

  Aromatic Solvents, Petroleum Resins, Drying Oils, Hydrocarbon Plasticizers, Methyl Mercaptan.

- **Coming from Hidalgo Chemical Company**

  Alcohols—Ethanol, n-Propanol, Iso-Butanol; **Acids**—Acetic, Propionic; **Aldehydes**—Acetaldehyde, Propionaldehyde; **Ketones**—Acetone, Methyl Ethyl Ketone.

- **From Standard Oil Company (Indiana)**

  Aromatic Solvents and Oil Additives.

- **First step in AMOCO Chemicals construction program**

  Aromatic Acids — Phthalic Anhydride, Isophthalic Acid, Terephthalic Acid, Benzoic Acid.

OCO

CHEMICALS

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PAN AMERICAN CHEMICALS CORPORATION

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AMOCO begins its manufacturing and marketing activities with the present products of Indoil and Pan American. Products from the huge Brownsville Plant of Hidalgo will be added when these facilities come on stream. The first step in AMOCO Chemicals' expansion program will be an aromatic acids plant.

This year and in the years ahead, AMOCO Chemicals expects to make important contributions to the chemical industry.

AMOCO CHEMICALS

AMOCO CHEMICALS CORPORATION
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Drop a seed into receptive earth. Up springs a tree to produce a thousand thousand seeds—and a forest is born.

Scientific research follows the same pattern, with ideas as seeds—with thoughtful men to nurture them in laboratories, and turn them to advantage.

In the past quarter century the seeds of many ideas have taken root in Shell laboratories and grown into needed products and services. They include: a new way to synthesize glycerine from petroleum; Epon resins which make possible superior adhesives and protective coatings; pioneer methods for enriching the earth with ammonia; a unique and efficient process for making hydrogen peroxide . . . and many more.

Through research, Shell Chemical is perpetuating a very useful forest.

Shell Chemical Corporation

Chemical Partner of Industry and Agriculture

NEW YORK

Dow—because of its rapid expansion—is beefing up its management team at all levels:

● It has added two more directors, five vice-presidents, three assistant officers.

● Newest reinforcement comes at the divisional level, with appointment of two management boards to help run its Texas Division.

Broader Top Management

Rapidly growing chemical firms often have trouble expanding all levels of their management teams at rates that keep pace with the growth of their operations.

Here's an answer to the problem from Dow Chemical: establish two management boards at its husky, fast-stepping Texas Division to draw more of the divisional management to top-level decision-making.

That division—which has received over a quarter of the more-than-$700 million Dow has spent for new plants in the last 12 years—has been headed since 1940 by A. P. Beutel. And while the division has been growing apace in physical plant and manpower, "Dutch" Beutel's corporate responsibilities have been mounting at nearly the same rate. They're now covered by these titles:

Member of Dow's board of directors.

Vice-president.

Texas Division general manager.

President of Dowell Inc., a company subsidiary.

Chairman of the advisory committee for the firm's Brazos Oil & Gas Co. Division.

In charge of Dow's newly established Louisiana Division.

To enable Beutel to devote more time to his non-Texas Division duties, and also to broaden the divisional management staff in keeping with the division's growth, Beutel has appointed these two managerial boards:

• **A five-man executive board,** which "will function as a management committee to study and make recommendations [to Beutel] on broad policy and managerial matters affecting the division." It's made up of the four assistant general managers and the controller of the division.

• **A 15-man operating board,** set up to coordinate the day-to-day operations of all manufacturing and plant service departments of the division. This is comprised of seven functional managers, five general superintendents, the director of purchases, the chief engineer, and the assistant to the general manager.

The latter official—J. L. Tod, a Texas-educated chemical engineer who has been with the division since 1941—will serve as secretary to this, and also to the executive board.

More at the Top: Meanwhile, Dow has reinforced its over-all corporate management team significantly over the past seven years as the company became bigger.

Here's the comparison: between 1950 and '56, Dow sales climbed from $220.8 million to $565.3 million, total assets doubled to $646.3 million, number of plant locations rose from seven to 15, and number of employees mounted from 14,500 to 25,200. During the same period, Dow's board of directors increased its membership from 13 to 15, the number of vice-presidents went from five to 10, and the total number of officers and assistant officers, from 12 to 18.

Several other major Dow divisions also have operating boards similar to the one in Freeport, but the Texas Division's executive board—like the division itself—appears to be unique. It also is entirely new to the division, whereas there was a forerunner to the operating board.

Beutel first organized a three-man operating board at Freeport in 1947. Two more members were added in '49, and another two in '50. After a period of inactivity, it was reorganized with six members. Four of these members now have moved up to the new executive board; the other two hold over as members of the enlarged operating board.

One point not to be overlooked: at the same time that these boards are strengthening local management and giving the divisional chief more time to handle his other Dow duties, the boards are also giving 20 hand-picked works officials on-the-job training that's potentially valuable in executive development. And—as noted above—Dow is finding need for more and more executives as its corporate size increases.

3 Wrapped into 1

With the long-awaited blessing of the U.S. Internal Revenue Service, a new chemical company—part of a $2.3-billion petroleum organization—sprang into being late last week.

Amoco Chemicals Corp. is the name of the new petrochemicals firm. Standard Oil Co. of Indiana is the proud parent. Made up of three former Standard affiliates, Amoco is one of the five big subsidiaries surviving that company's functional reorganization move—proposed last year and now effected—to consolidate 12 then-extant units for efficiency and economy.

Amoco's predecessors:

• Hidalgo Chemical Co., a subsidiary of Stanolind Oil & Gas Co. Its principal asset: the synthetic gasoline plant at Brownsville, Tex.

• Indoil Chemical Co., whose function was to market chemicals made by other Standard operating units.

• Pan American Chemicals Corp., producer and seller of petroleum chemicals in the Eastern states. It was a subsidiary of Standard's East Coast affiliate, American Oil Co.

Headquarters for the new chemical entity will be in Chicago, along with the corporation's main office. (Other surviving companies will be based in Tulsa and New York.) Amoco's chief executive will be 51-year-old Jay Forrester, Texas-born chemical engineer who formerly served as manager of Standard's research activities and more recently as Indoil president.

BASED ON MAP PREPARED FOR CHEMICAL WEEK BY NORTH PACIFIC CONSULTANTS

Process Plants Push Alaskan Statehood

Chemical process industry development may be one of the keys to Alaska's long-thwarted bid to become either the 49th or (if Hawaii makes the grade first) the 50th of these United States.

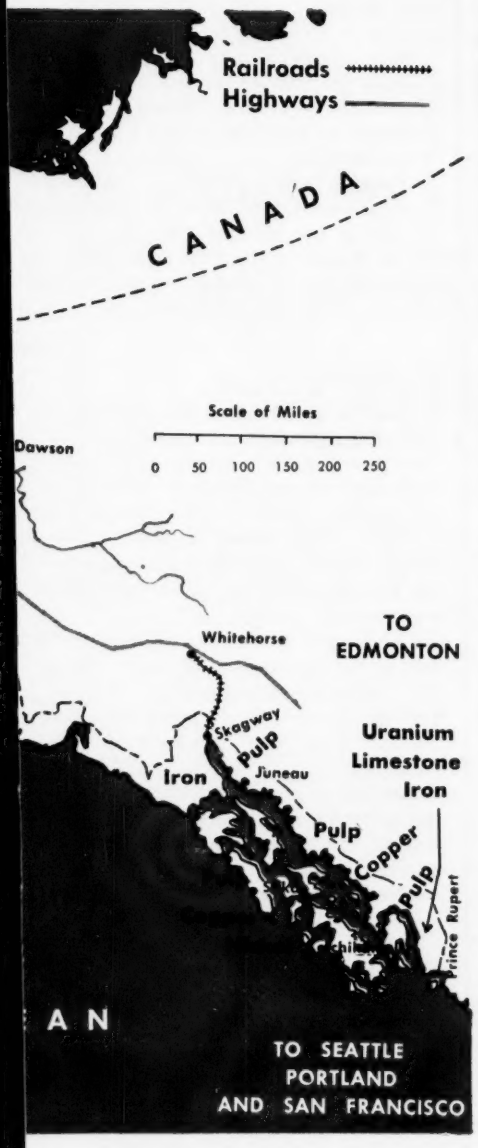
Up to now, Congress has always said "No," mainly because the roomy territory—bigger than Texas, California and Montana combined—is very sparsely populated. Its 1956 civilian population is estimated at 170,000, and though this is more than triple the 1920 figure, it is still only on a par with the 48th-ranking state, Nevada.

And so far, this lack of population has been part of a vicious cycle for Alaska: it doesn't have enough people to make up a sound market; so there's not enough of a market to attract industry; so there's not enough industry to provide jobs to support a larger population.

The statehood question illustrates another perennial frustration of Alaskans: if they had their own state government, they might, by opening up publicly owned lands for private development, be able to attract industry. Without industry, there's not enough population to convince Congress that statehood is warranted.

Now, however, natural-resource-based industry—with chemical process companies in the vanguard—may be about to break these chains.

One pulp mill is already in operation in the territory's "Panhandle" section, which extends southward along the Pacific Coast almost half the 1,150 miles from Alaska-proper to Seattle. Three more pulp and paper plants



ALASKA'S PROCESS PLANTS: ONE NOW, FOUR TO COME

In operation:

- Ketchikan Pulp Co. (affiliated with Puget Sound Pulp & Timber Co. and American Viscose Corp.), 400-tons/day rayon-grade pulp plant, near Ketchikan, operating since May '54.

In construction, or being financed:

- Alaska Lumber & Pulp Co. (currently financed by Japanese interests, but seeking U.S. participation), 300-tons/day high-alpha cellulose pulp mill, near Sitka, to be completed in '59.
- Alaska-Yukon Refiners & Distributors, Ltd., 6,500-bbls./day petroleum refinery, near Skagway, to be completed in '58.
- Georgia-Pacific Alaska Co. (subsidiary of Georgia-Pacific Corp.), 500- to 750-tons/day newsprint plant, in the Panhandle, to be completed in '61.
- Pacific Northern Timber Co., 100-tons/day sulfite pulp-newsprint plant, in the Panhandle, by '62.

are being constructed in, or blueprinted for, that same area. An oil refinery is also being built there, and entrepreneurs are trying to figure how soon a chlorine-caustic plant might be profitable.

Mineral Base: Geologists agree that Alaska's mineral wealth—which has already yielded more than $1 billion worth of fuels, metals and ores—has hardly been sampled. As the territory's hydroelectric generating capacity is tapped, the processing of Alaska's minerals close to its mines, wells, power or seaports can become economic. This should create a market for sulfuric acid and other heavy chemicals.

Alaska's agriculture is already growing, and this growth—fostered by the cost of shipping in food products from southern Canada and the U.S.—will be accelerated by the continuing rise in population. An increasing market for fertilizers and other agricultural chemicals thus seems certain. In fact, industrialists are already weighing the economics of a nitrogen plant near Anchorage.

Transportation costs may also stimulate other process industries. One example: cement. Despite the territory's quantities of limestone and other raw materials, all the material used there is now shipped in from Seattle and Portland.

Setback on Aluminum: In recent years, Alaskans' biggest hopes for a breakthrough in the industrialization stalemate have been riding on two proposals for aluminum reduction plants. Both of those projects have now been shelved, but, according to such close observers of the Alaskan scene as North Pacific Consultants (Portland), the power aspects of these two schemes are so favorable that the projects might be revived later.

Aluminum Co. of America had blueprinted a $400-million smelter near Skagway that would use power generated by Yukon River water from Canada. This project bogged down when Canada declined to relax a law limiting the export of water for electric power generation.

The other aluminum smelter project was conceived by Harvey Aluminum Co., which obtained a preliminary permit to investigate the so-called Wood Canyon site on the Copper River, about 180 miles east of Anchorage. Harvey dropped this idea last year, but Central Alaska Power Assn. has applied for an investigatory permit and apparently intends to press for construction.

Rx for Alaska: In addition to statehood, Alaskans are asking Congress for legislation aimed at speeding up industrial development. Their prescription would include:

- Obtaining more detailed and comprehensive natural resource surveys.
- Free transferral of certain federal lands to Alaska for development.
- Establishing a joint commission with Canada to work out arrangements for roads, railroads, hydro projects

ADMINISTRATION

and shipping facilities for the mutual welfare of Alaska and western Canada.

• A 20-year holiday from federal taxes to help private industry get well established in Alaska. (Puerto Rico now enjoys a somewhat similar federal tax exemption.)

There's little doubt that these measures would accelerate industrialization in the territory. But recent events indicate that chemical process firms are finding Alaska's attractions adequate without added inducement.

LEGAL

'Anti-Hoxsey' Posters: The Food & Drug Administration has made it clear that it will make a strong effort to drive from the market drug products it considers worthless or harmful.

It has mailed out 46,000 posters to be displayed in post offices throughout the U.S. describing the Hoxsey cancer treatment as worthless.

Use of posters actually represents the second unprecedented move by FDA in its nine-year fight to put Harry Hoxsey out of the cancer-treating business. Last April, FDA issued a public warning—the first move of that nature ever taken by the agency—saying the treatment is not only worthless but also in some cases may speed the growth of cancer.

The posters, headed "Public Beware," warn the public that "the Hoxsey treatment for internal cancer has been found worthless by two federal courts."

•

'Fair Trade' Case: Abbott Laboratories has been awarded a permanent injunction by U. S. District Judge Dorsey Watkins at Baltimore that prohibits Dart Drug Corp. from selling Abbott products for less than the minimum retail price established by the manufacturer.

The North Chicago pharmaceutical firm had charged Dart with violating Maryland's "fair trade" laws, and cited violations at the Dart store at Silver Springs, Md.

Two previous Abbott fair-trade suits in Maryland were withdrawn late last year after the defendants, Drug Fair and Peoples Service Drug Stores, agreed not to issue trading stamps in connection with the sale of Abbott products unless they added the value of the stamps to the Abbott fair-trade price.

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ADMINISTRATION

WIDE WORLD

PROSECUTOR OLNEY: He'll round out 3-way drive on union racketeers.

LABOR

Anticorruption Campaigns: Racketeers in labor unions will be under attack from three directions this year, it became clear this week. Moving in to investigate and prosecute will be these three groups:

- A special bipartisan Senate committee set up to study criminal and other improper practices in the field of labor-management relations and to determine whether new federal legislation is needed to protect the public, employees and employers.
- AFL-CIO's own Ethical Practices Committee, which has just laid down a new code aimed at preventing graft and double-dealing on the part of union officials, and which is already acting on corruption charges against officers of three affiliated unions.
- The U.S. Justice Dept.'s Criminal Division, whose chief prosecutor —Asst. Atty. Gen. Warren Olney—has promised to keep up a drive against labor racketeering. Olney says his division obtained 14 convictions on labor racketeering charges in '56 and that 30 indictments are now pending against 60 defendants.

•

On the Bargaining Front: As can be seen in the strike by Oil, Chemical & Atomic Workers (AFL-CIO) at three plants of Union Carbide's Linde Air Products Division, labor unions are not ready to accept President Eisenhower's suggestion that all parties use restraint in wage negotiations this year. OCAW is asking for hourly rate increases of 20¢ or more, while Linde has offered 12¢ across the board. AFL-CIO is asserting that wage rises should not be geared strictly to productivity gains, but should also come out of profits. This point is expected to be raised in a forthcoming hearing by the House-Senate Economic Committee.

KEY CHANGES

Edwin G. Clarke, to vice-president in charge of European operations, Acheson Industries (New York).

George E. Hawkins, to executive vice-president, Air Reduction Co.

Wallace H. Woodrow, to vice-president in charge of engineering, Dayton Rubber Co. (Dayton, O.).

C. Nicholas Priaulx, to director, vice-president and treasurer; and **John W. Farley,** to director, vice-president, and Equipment Division manager; Whitman Laboratories (Norwich, N. Y.).

Percy J. Ebbott and **James Bruce,** to directors, Revlon, Inc.

E. Van Dornick, to director and Refinery and Chemical Division vice-president, Macco Corp. (Paramount, Calif.).

Lee R. Jackson, to board vice-chairman; **Raymond C. Firestone,** to president; and **James E. Trainer,** to executive vice-president; Firestone Tire & Rubber Co.

Orville H. Schell, Jr., to director, Merck & Co.

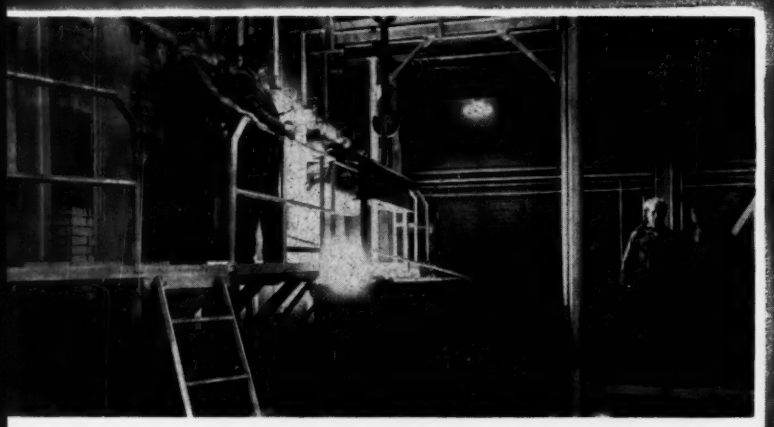
Richard O. Westley, to Chemurgy Division general manager, Glidden Co.

Hamilton Hadden, Jr., to secretary, Chemstrand Corp.

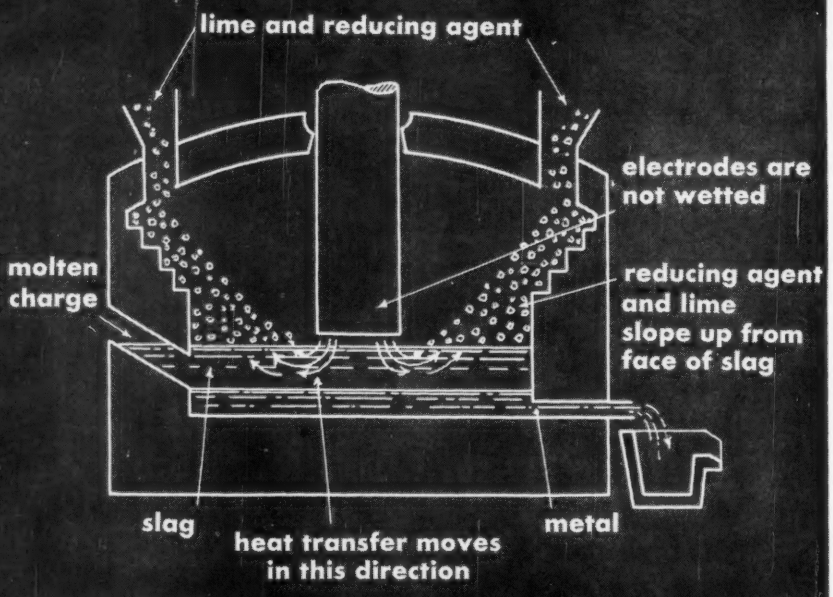
Edward C. Hastings, to comptroller, **Carl W. Eurenius,** to assistant general manager, Paper Makers Chemical Dept.; and **Werner C. Brown,** to assistant general manager, Cellulose Products Dept., Hercules Powder Co.

Russell A. Clayton, to vice-president and assistant treasurer; and **A. N. Warburton, Jr.,** to controller and assistant treasurer; Kaiser Aluminum & Chemical Corp.

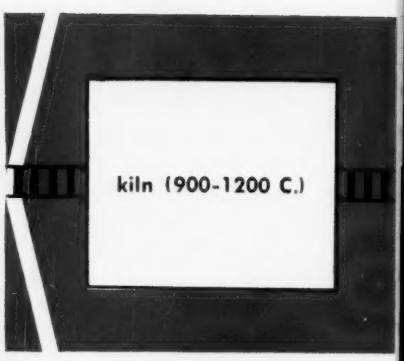
John P. Holmes, to president, Celanese International, subsidiary of Celanese Corp.



Furnace Holds the Secret



In the special arc-resistance furnaces designed by Marvin Udy (top, facing camera with son, Murray, back to camera), electric-arc heating and resistance heating are combined. Electrodes in a covered furnace (bottom) are kept close enough to surface to insure maximum delivery of arc-developed heat into slag. But the electrodes themselves are not wetted by the slag. Resistance to the passage of current further heats the slag. Reducing charge is placed on surface of molten slag and is heated by it. The furnace operates at 95% power factor. And by avoiding local overheating, vaporization-loss is kept down.

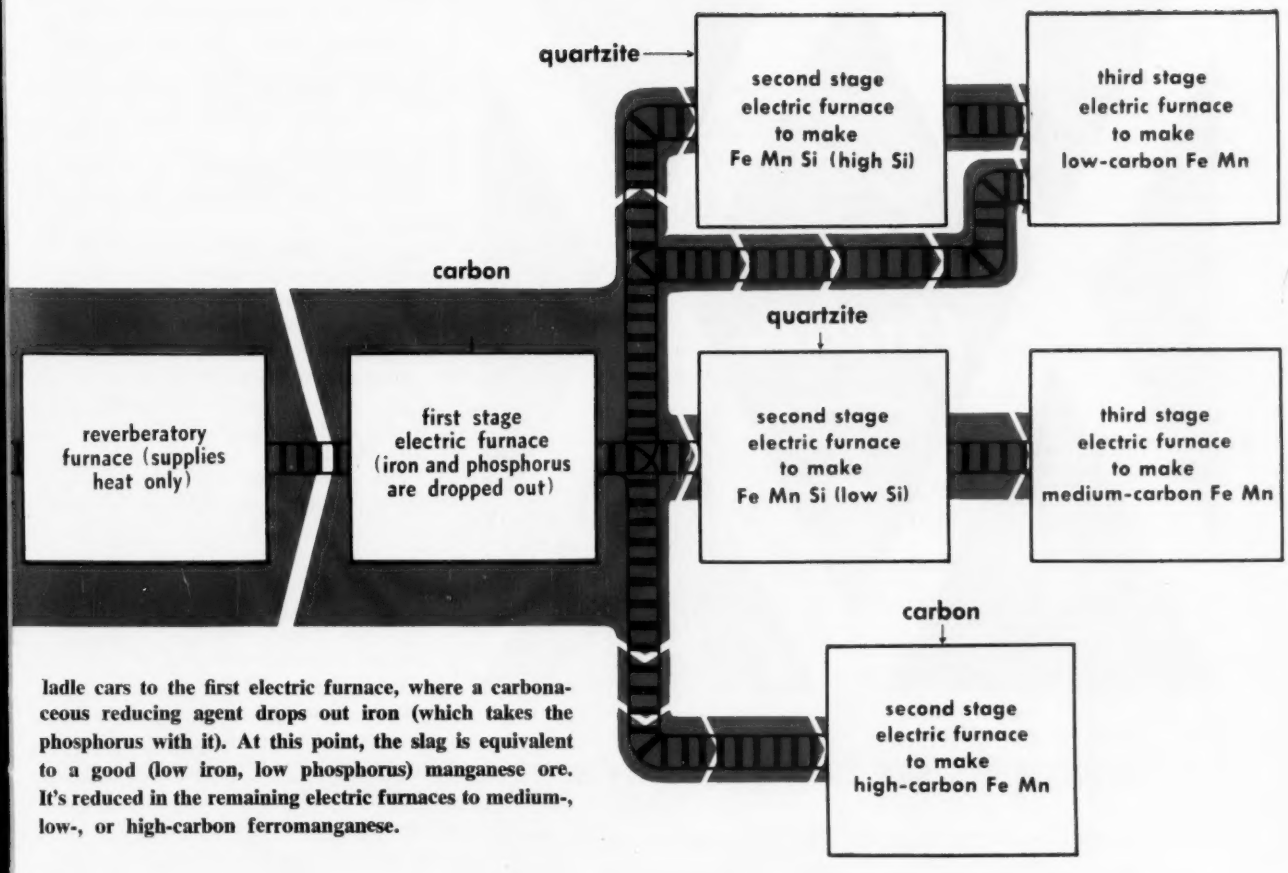


Low-grade manganese ore is ground, dried and fed to a kiln where it is converted into a stable form. From there, it is sent to a reverberatory furnace that brings it to the melting point. The liquid slag is moved in

How to

Just a few weeks ago, some highly regarded electrochemical people would have given fancy odds that the process above would never prove to be an economic way to make ferromanganese. But this week, Marvin Udy—inventor of the process, and a highly regarded electrochemist himself—is busy gathering production data that is giving the handicappers cause to reconsider.

The Niagara Falls prototype plant utilizing Udy's process has been in partial production over a month now (*CW Technology Newsletter, Jan. 26*). Operated by Strategic-Udy Metallurgical and Chemical Processes, Ltd., it's designed to handle 50 tons of ore a day. On the basis of ore now being used, that would mean a daily yield of the order of 7 tons of ferromanganese and 7 tons of ingot iron.



ladle cars to the first electric furnace, where a carbonaceous reducing agent drops out iron (which takes the phosphorus with it). At this point, the slag is equivalent to a good (low iron, low phosphorus) manganese ore. It's reduced in the remaining electric furnaces to medium-, low-, or high-carbon ferromanganese.

Pull Manganese from Poor Ore

The operation has thus far been so successful that Udy and his associates already are starting to engineer a $15-million, 75,000-tons/year plant in New Brunswick, Canada.

And they are looking beyond that —to the use of the technique for handling of low chrom-ferrous chromite, high-ferrous bauxite, titaniferous magnetite and other ores.

Some Unconvinced: All of the skepticism evoked by the Udy process hasn't dissipated. There's still a considerable weight of opinion that wants to see some solid operating data before it will believe that Udy's estimates on attainable costs are not overly optimistic.

What they find difficult to accept: Udy's claim that he can take a low-grade manganese ore and convert it into ferromanganese at costs that are comparable to those achieved by producers working with high-grade material.

In present operations, for instance, he's processing a high-iron (18%), low-manganese (12%) ore that also runs high in phosphorus. He claims that from this ore he can produce ferromanganese that will compete with the product derived from 48% ore. And he says he can do it without taking credit for ingot iron that can be produced as a by-product of the process (1 ton of iron is produced for every ton of ferromanganese). The iron, he feels, should command a price of at least $70/ton.

His big saving, of course, is on the cost of the raw materials. It takes 2 tons of high-grade ore to produce 1 ton of ferromanganese by the present commercial process. And each ton of ore is worth $60. Udy's process requires 6 tons ore ton ferromanganese. But it can be laid down at the plant for $4/ton. That figures to a raw-material saving of $96 on a ton of ferromanganese, which sells for approximately $245/ton. (And, Udy says, it might be possible to get ore for $1.50/ton.)

Getting the Iron Out: Udy's method of treating low-grade ore is selective reduction. First, iron drops out, carrying phosphorus with it. By lowering the iron and phosphorus content, the manganese content is raised correspondingly. At this point, in fact, the process produces a slag that is, in reality, a pretty good grade of manganese ore.

Subsequent treatment is dictated by the product desired:

- For a high-carbon ferromanga-

nese, the slag is reduced directly with carbon.

- For a medium-carbon ferromanganese, which Udy pegs as the most desirable product to make, marketwise, slag is reduced with quartzite and carbon to form ferromanganese-silicon (16-18% silicon). This is used as a reducing agent to convert more slag into medium-carbon ferromanganese.
- To make a low-carbon ferromanganese, the procedure is the same except that more energy is put into the reduction of slag. Product is a ferromanganese that contains 40% silicon.

Engineering Trick: But adapting the principle to commercial equipment is quite an engineering trick. This is how Udy does it:

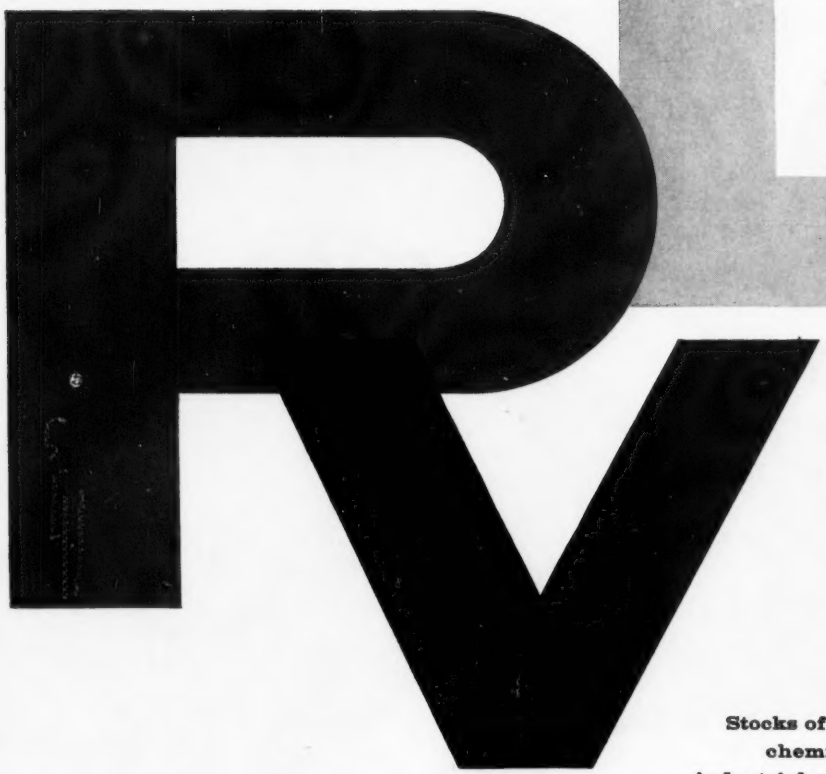
Ore is brought into the plant, ground, sent through a rotary drier and kilned at 900-1200 C. This drives off oxygen, water and some carbon dioxide. More important, it thermally reduces the iron oxide to stable FeO. The iron oxide's stability makes it possible to determine just how much reducing agent will be required later and, in effect, introduces a degree of control that would not otherwise be possible. Weight loss in the kiln is approximately 13%.

From the kiln, the sintered ore is transferred to insulated ladle cars and fed to a reverberatory furnace. This is an oil-fed, side-firing furnace placed in the line to conserve electricity. Its only function is to bring the mass up to its melting point, 1350 C.

From the kiln, the material is transferred in other, refractory-lined, insulated cars to the first electric furnace. Here, coke is added to reduce the iron, which acts as a gatherer of phosphorus. Both iron and phosphorus are dropped out. The phosphorus can be separated from the iron in another electric furnace to yield a marketable pig iron. (The phosphorus can be converted into a product that might be used as a fertilizer.)

Two key factors are involved in this reduction in the first electric furnace: the amount of flux added and the design of the furnace itself. Udy points out that, in customary practice, large amounts of lime or other basic material are added to flux acid components, such as silica. Result is a relatively large quantity of high-melting slag that dilutes the manganese—which you're trying to concentrate. And the

FOR THE PAINT, VARNISH AND LACQUER INDUSTRY



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diethyl phthalate

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dibutyl phthalate

di-isobutyl phthalate

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–an octyl butyl phthalate

dioctyl phthalate (DOP)

di-isooctyl phthalate (DIOP)

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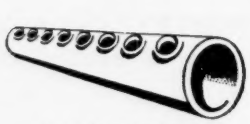
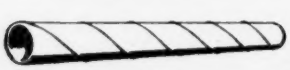


Multiple outlet headers

Production forgings

Venturi reducers



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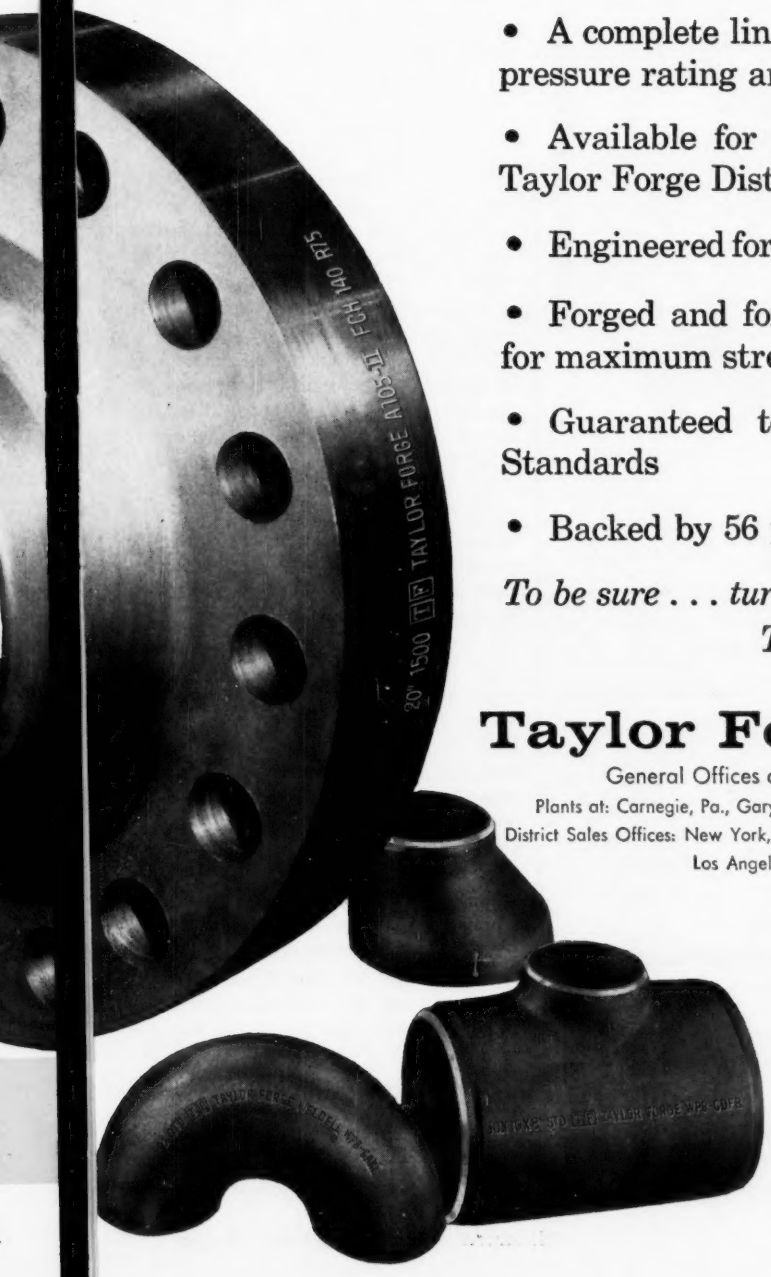

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higher temperatures that must be reached to melt the slag can mean relatively high volatilization losses of manganese.

Udy, however, has found it possible to utilize the values of MnO, contained in the slag, as a basic fluxing component. In practice, he adds just enough lime to maintain a base-to-acid ratio of 1:1.

In the design of the furnace (*see p. 40*), Udy has combined arc heating and resistance heating. Electrodes are placed in a covered furnace and portioned from ½ in. above the surface of the slag to 2 in. below it.

The carbonaceous reducing agent and lime are introduced so that they rest on the surface of the slag and are heated by it. As the metal is reduced, it drops to the bottom of the slag and is tapped off.

The short arc insures a maximum delivery of arc-developed heat into the slag. Absence of charge around the electrodes prevents agglomeration and the formation of local hot spots. Thus, Udy is able to operate at a power factor of 95% instead of the 75-85% that's usual for arc furnaces. And he's able to operate at temperatures that are constantly kept below the boiling point of manganese. That, in turn, is the clue to his yield figures of 95%.

After the iron and phosphorus are removed, the slag is sent to a second-stage electric furnace where it is converted into either the high-carbon ferromanganese or the ferromanganese silicon (high or low silicon). In the latter case, it's sent to a third-stage furnace where, as the reducing agent, it converts more slag into low- or medium-carbon ferromanganese. Both the second- and third-stage furnaces are similar in design to the first-stage furnace. (For experimental purposes the third-stage in the prototype plant is a tilting furnace.)

Heat Bonus: In the original estimates of the process, Udy figured that it would take 7,000 kwhr. to make a ton of ferromanganese. And the feeling was that since the estimates were scale-ups of pilot-plant figures, the larger installation would use even more power.

But, for reasons that aren't at all clear, he found that, in the large plant, the reduction of the iron uses only enough current to regain the heat-loss —about 50 C—in the transfer from the

PRODUCTION

reverberatory furnace. Says Udy: "The reaction goes exothermically, even explosively." His son, Murray Udy, research director of the company, and others feel that it may be an involved principle dealing with rates of reaction.

Many Failed: Lots of people before Udy have tried—unsuccessfully—to develop a ferromanganese process based on low-grade ores. That's why there's even more than the usual amount of skepticism surrounding his work.

But as one top-notch metallurgist puts it, Udy is "one of the best furnace men around and . . . not famous for making boners."

Another says critically: "I have seen his process (on a small scale) and have studied his figures. There's no reason why the various steps in the process shouldn't work. But his cost figures, I think, are highly optimistic. I want to see more data before I am convinced it can be done economically."

The same critic freely admits, however, that optimism is a necessary ingredient of invention.

EQUIPMENT

Transistor Switch: Delco Radio Division of General Motors is now mass-producing power transistors capable of switching loads greater than 1 kilowatt. Because the transistor switch requires only 1 watt for its operation, says Delco, thin wiring may be used for remote-control circuits. Suitable for control of multihorsepower motors, the switch has a maximum dc. rating of 13 amperes, is said to completely eliminate arcing.

•

Vacuum Pump: Arthur F. Smith Co. (Rochester, N.Y.) has developed a 1-in., water-cooled oil-diffusion pump for attaining high-vacuum operating pressures at a rapid rate. It pumps 15 liters/second at 10^{-4} mm. The unit requires only 15 ml. of pump fluid, develops vacuum of 5×10^{-6} mm.

•

Leakproof Fittings: A thin layer of plastic on the inside wall of its Uscoweld plastic fittings, says U. S. Rubber Co., is the key to leakproof joints in cemented or solvent-welded plastic-pipe installations. Made of a styrene-acrylonitrile blend, the fittings have a flared entrance to facilitate insertion and to align pipe automatically for welding.

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MR. 'AVERAGE': Compared with counterparts in other industries, top chemical executives get middling rewards.

CW Report

By W. Cameron Caswell

Are We Underpaying Top Chemical Management?

IN recent years, chemicals have registered bigger annual sales and profit gains than have most industries. Yet, top chemical management's earnings have increased at a rate that is only slightly higher than the average for top executives of major industries.

What's more, chemical executive compensation gains are average when measured in absolute terms or in proportion to changes in net sales and net profits.

Even the number of chemical industry executives who received raises, pay cuts or no salary change in 1955 vs. '54 (the latest years for which comparative figures are available) was about equal to an 18-industry average.

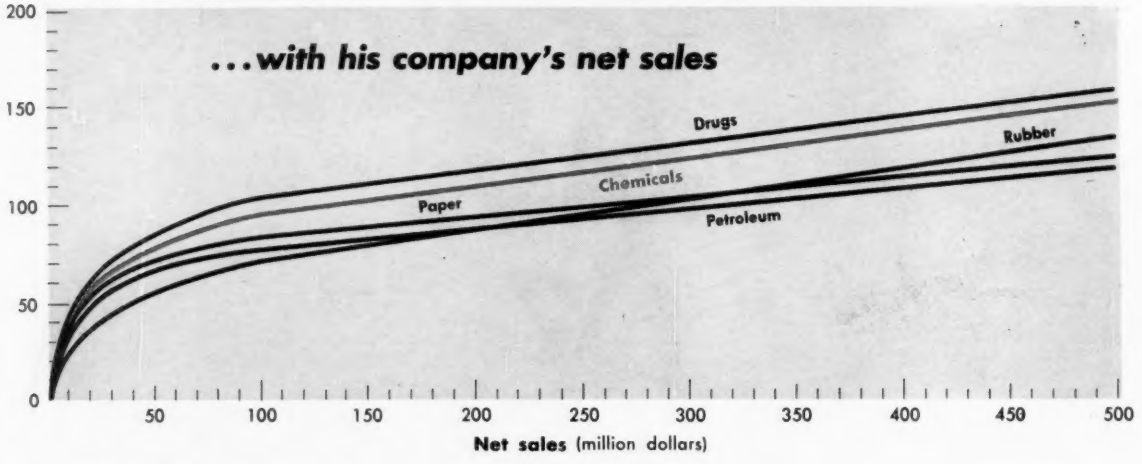
In fringe benefits, too, chemical top management does only slightly better than average.

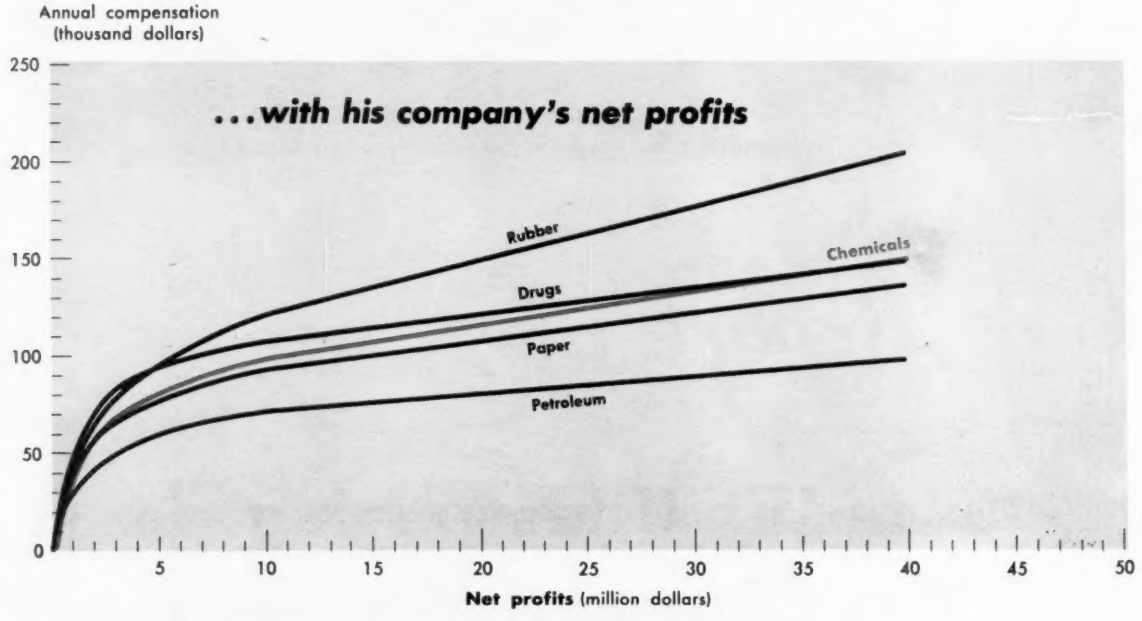
Clearly, there is ground for doubt that average executive compensation is high enough for an industry whose future is so closely tied to profits—especially since profits provide funds for expansion financing, as they do in today's tight money market. And profits affect security market values, which, in turn, influence borrowing and financing for expansion.

If, as it appears, both volume and profit improvements have more impact on growth in the chemical industry than in many other industries, it would seem logical that rewards for profit-making should be greater in the chemical industry than in most industries.

A number of chemical corporations already pay outstanding rewards for outstanding executive performance.

How a Top Executive's Compensation Varies





C W Report

But in most chemical companies, top-management compensation is determined more by traditional industry practices than by chemical firms' individual needs.

Many firms could well tailor executive compensation to fit their growth plans.

That's the lesson to be learned from the statistics* presented further along in this report. Gleaned from information filed with the Securities & Exchange Commission by 606 large companies (37 of them chemical), the data delineates:

- Gains made in chemical executive compensation at the last count (1955 vs. '54; 1956 data will be available late this year).
- Relationship between sales, profits and compensation in major industries.
- Factors controlling executive compensation.
- Relationship between chief executive compensation and that of subordinate executives.

* Part of a continuing study by McKinsey & Co., Inc. (New York), management consultants, on executive compensation, current and deferred income, stock options, pensions and bonuses.

Executive Compensation:

Smallest Gainer

Tops in Their Field in '55

Automobile

Harlow H. Curtice, president
General Motors
Compensation: $776,400
Net Sales: $12.4 billion
Net Profits: $1.2 billion

Steel

Eugene G. Grace, chairman
Bethlehem Steel
Compensation: $705,923
Net Sales: $2.1 billion
Net Profits: $180.2 million

Chemicals

Crawford Greenewalt, president
E.I. du Pont de Nemours
Compensation: $642,619
Net Sales: $1.9 billion
Net Profits: $431.6 million

Radio & TV

Edward R. Murrow, director
Columbia Broadcasting
Compensation: $316,076
Net Sales: $316.6 million
Net Profits: $13.4 million

Tobacco

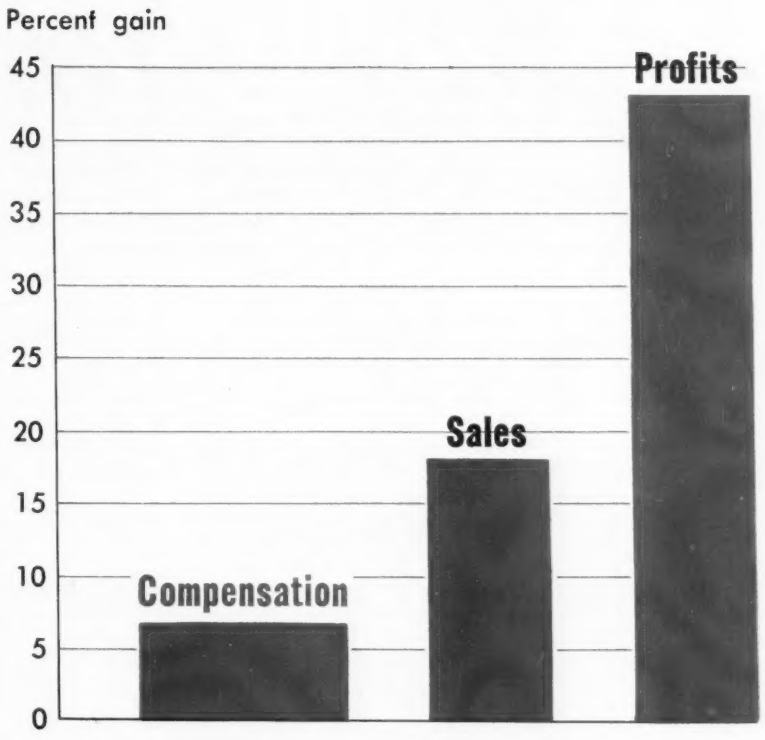
Paul M. Hahn, president
American Tobacco
Compensation: $272,724
Net Sales: $1.1 billion
Net Profits: $51.7 million

Oil

Eugene Holman, chairman
Standard Oil Co. (N.J.)
Compensation: $234,357
Net Sales: $1.4 billion
Net Profits: $709.3 million

Communications

Cleo F. Craig, president, AT&T
Compensation: $217,119
Net Sales: $721.0 million
Net Profits: $664.2 million



In 37 big chemical companies, compensation to the top executive rose an average of 6.8% in 1955 (over '54). Sales and profits, however, increased 18% and 43%, respectively.

• Fringe benefits now being offered chemical industry chief executives compared with those being offered top men in other industries.

Chemical Industries Record: What are the present underlying trends in compensating top chemical industry executives? In 1955, some 40% of its chief executives received compensation boosts; 46% had no change; 14% got less than they did in '54.

The average gain was 6.8%, sales increase 18%, and profits 43% (*see chart above, Executive Compensation: Smallest Gainer*).

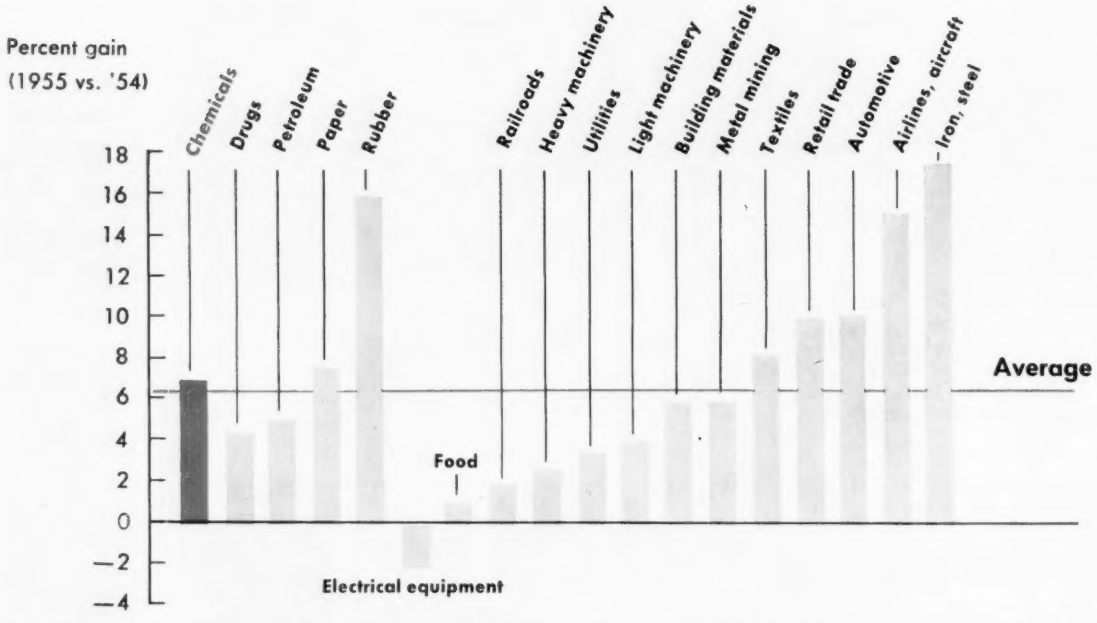
A comparison of this record with that of other industries reveals that chemical executive compensation increased close to the 6.3% average of the 18 industries under study. Chemical industry sales gains were 20% above average, and profit increases were 26.5% above average.

Thus, for better-than-average sales and profit gains, top chemical executives made only a slightly greater compensation gain than the average for top executives of all industries (*see chart, p. 54, The Chemical Industry's Record on Three Counts*).

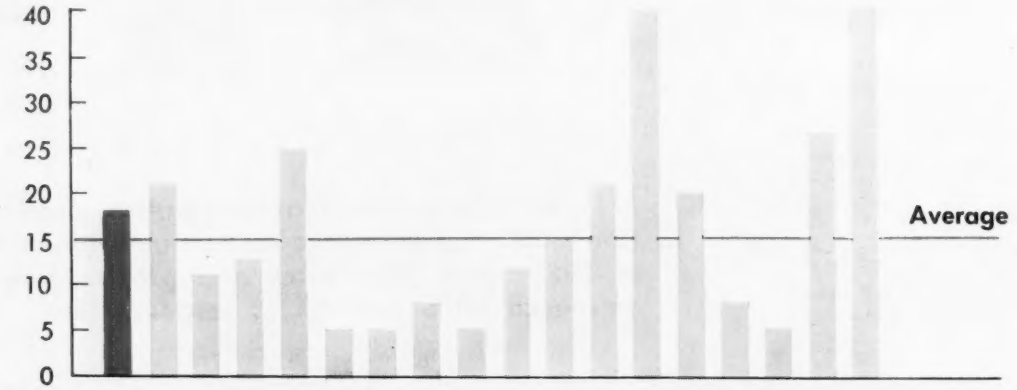
Company Size Counts: Where top chemical executives stand in relation to other industry chiefs on the compensation ladder depends on company size, viewed either from a net sales or net profits angle (*see chart, pp. 56-59, The Top Executive*).

Chemical firms in the $30-million/year and $100-million/year sales brackets pay their No. 1 executives close to the top rewards ($65,000/year and $94,000/year,

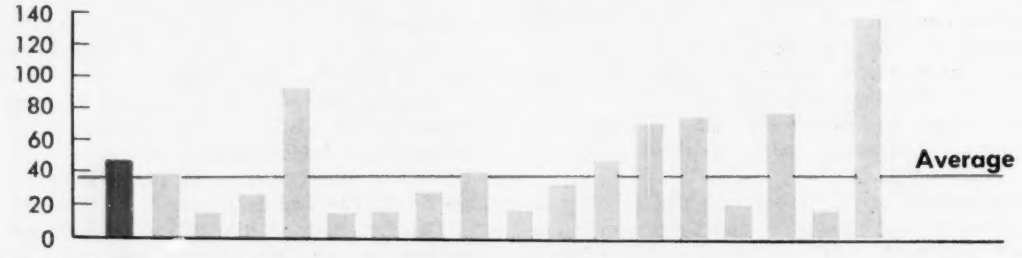
The Chemical Industry's Record on Three Key Counts



1. Just about average in boosting compensation of top management . . .



2. 20% above average in making sales gains . . .



3. 26.5% above average in recording profit increases.

C W Report

respectively) paid by any company of those sizes. But the chemical executive stands near the middle rung of the compensation ladder (at $153,000/year) among firms with $500 million/year sales. Textile companies in the $500-million/year sales class pay their chief executives some $192,000/year—more than in any other industry.

Contrasting chemical industry compensation with that of other industries, according to net profits, shows that chemical executives are again in the great middle ground, but this time at all profit levels—$3 million/year, $10 million/year, $40 million/year (*see chart, pp. 56-59, The Top Executive*).

Here, the cardinal point is not that a chemical chief executive's salary is in the middle range at the $3-million/year profit level but, rather, that he moves no nearer the top of the all-industry compensation list when he gets into the $40-million/year profit category.

Effects of company size on executive compensation may be considered in still another light by analyzing the compensation increase that an industry offers top executives for managing a large enterprise contrasted with a small one. Put another way, what can an executive expect if he raises his company profits from $3 million/year to $40 million/year, or transfers to another and larger company?

In the average chemical firm, such a hike in his company's profits would net the top executive a 111% increase in his compensation. This increase, however, is typical of many other industries as well (*see chart, p. 60, How Big a Reward for Bigger Profits?*).

To obtain, say, a 206% increase for a similar profit-building achievement, a top executive should apply his management talents in the utilities industry. Unquestionably, however, the higher reward offered by that industry reflects the increased difficulty associated with accomplishing the profit-building job.

In this context, it's interesting to examine: (1) the percent of increase in compensation for each percent of increase in sales, and (2) the percent of increase in compensation for each percent of increase in profits (*see chart, p. 61, Incentive Yardstick*).

Using the first measure, chemical industry turns up squarely in the middle again, between the 3% top limit (registered by airlines and aircraft industries) and the —0.44% low (found in electrical equipment industries in 1955).

Clustered around chemicals in this mid-area are a number of other basic industries—e.g., petroleum, iron and steel, building materials and automotive.

Growth opportunities vary from industry to industry.

Meet the Author

A principal of McKinsey & Co. (New York), Management Consultant W. Cameron Caswell (A.B., '39-Yale) has for the past nine years specialized in industrial marketing and distribution.

Prior to that, he served for nine years as Eastern sales manager, later commercial research director, for Westvaco Chemicals Corp.

This experience puts Caswell in good stead to deal with chemical industry problems. Combine this with his firm's long-standing interest in executive compensation and you can see how author and subject got together in CHEMICAL WEEK.

Caswell suggests that chemical firms might well consider whether they are paying average rewards to top executives, expecting above-average profits and sales in return.

Many *CW* readers may recall his previous report (*CW, Nov. 1, '52*) titled "Competitors or Partners," which put the role played by chemical wholesalers and distributors into new perspective.

C W Report

The Top Chemical Executive

In a group of top executives

Near the top among those representing firms with $30 million/year net sales . . .

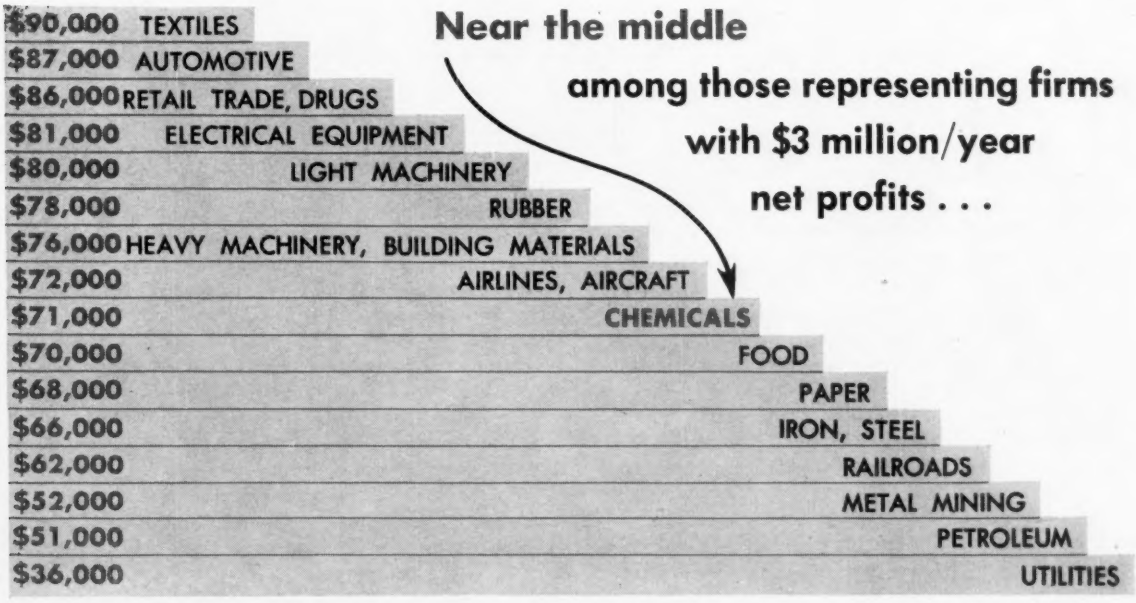
$74,000	DRUGS
$65,000	CHEMICALS LIGHT MACHINERY
$64,000	PAPER
$63,000	ELECTRICAL EQUIPMENT METAL MINING, RETAIL TRADE
$62,000	BUILDING MATERIALS
$58,000	AUTOMOTIVE, HEAVY MACHINERY FOOD, PETROLEUM, IRON, STEEL
$54,000	AIRLINES, AIRCRAFT
$53,000	TEXTILES
$50,000	RAILROADS, RUBBER
$44,000	UTILITIES

Slightly lower among those representing firms with $100 million/year net sales . . .

$105,000	DRUGS
$95,000	LIGHT MACH
$94,000	CHEMICALS IRON, STEEL
$92,000	TEXTILES
$90,000	BUILDING MATERIALS
$88,000	AUTOMOTIVE HEAVY MACHINERY
$87,000	METAL MINING RETAIL TRADE
$86,000	PAPER
$82,000	RUBBER
$81,000	ELECTRICAL EQUIPMENT
$78,000	PETROLEUM
$76,000	AIRLINES, AIRCRAFT
$74,000	FOOD
$72,000	UTILITIES
$70,000	RAILROADS

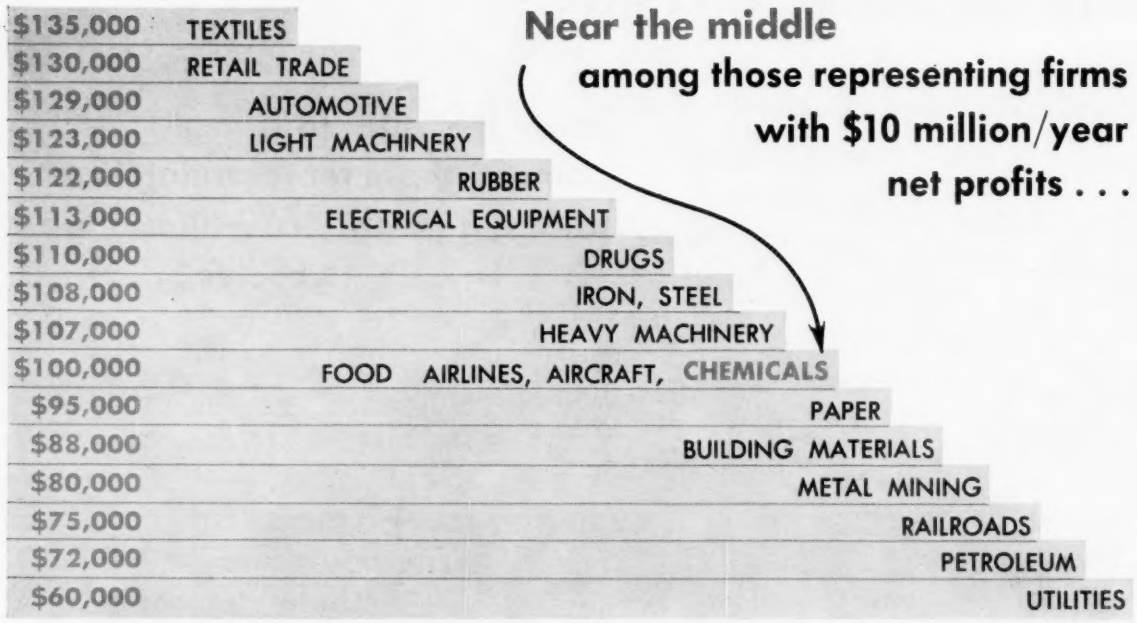
—How His Earnings Compare

in 18 industries, he ranks . . .



The Top Chemical Executive

In a group of top executives



C W Report

In utilities, for example, growth is predictable. The industry grows with increasing population and national industrialization. Any utility company is bound to expand as its market grows. There is little opportunity to outpace competitors. There are, in fact, few competitors. Thus, steady but modest growth is typical, rather than a matter of extreme diligence on management's part.

In the chemical industry, on the other hand, growth opportunities are of two kinds: (1) increasing sales of established products, and (2) expansion into new products and related fields of business. Growth potential—and, presumably, the need for rewards to stimulate increased sales—is great.

Whether or not an "average" reward for increasing sales is proper recognition for fostering corporate growth is a question worthy of management's utmost consideration. That's especially true since growth is not merely desirable in the chemical industry, but is an absolute need. To lag is to court annexation or merger.

Profit Picture: Top chemical management now receives an average 0.16% increase in compensation for each 1% increase in profits. Compared with other industries, this rate is, once again, only average.

Airlines and aircraft top management in 1955 received an average 1.07% increase in compensation for each 1% increase in profits—the highest rate of any industry. Food industry executives, at the low extreme, registered only a 0.07% increase (electrical equipment industry management compensation actually decreased 0.17% for each 1% increase in profits in '55).

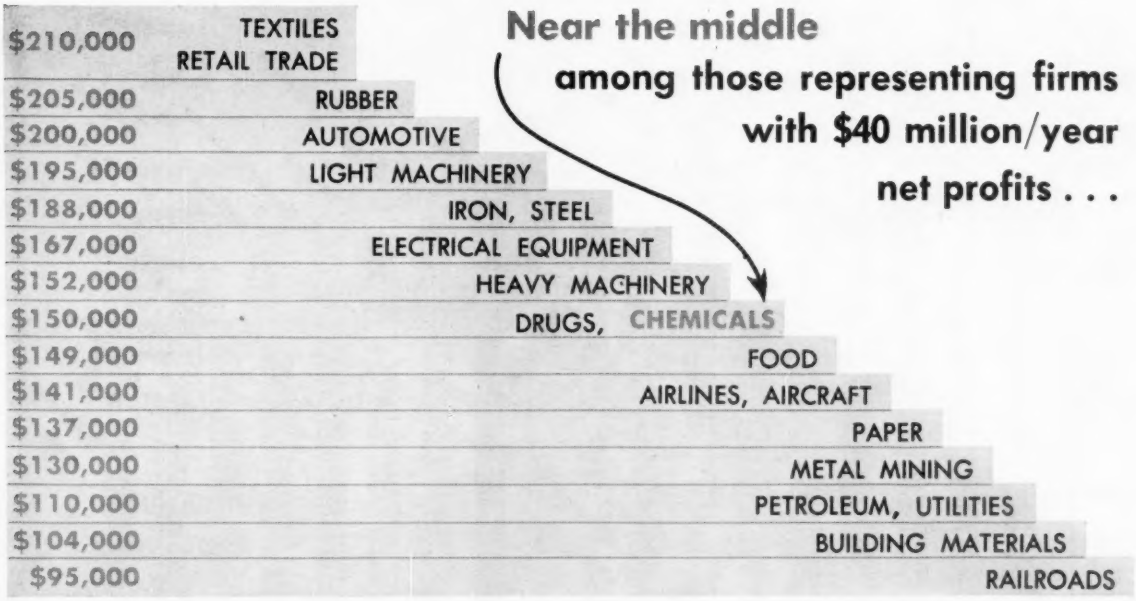
Occupying the same middle ground with chemicals are: automotive industry, building materials, iron and steel, drugs and cosmetics, light machinery, rubber and utilities.

Here again, the chemical industry would be well advised to re-examine rewards granted executives for accomplishing the profit-making job expected of them.

Since the chemical industry is so dependent on reinvesting profits for growth purposes, chemical companies should provide above-average rewards to those top executives who produce these all-important profits. That's

—How His Earnings Compare

in 18 industries, he ranks . . .



especially so now, when profit margins are being squeezed.

Price on People: Effectiveness in building a management team is another factor influencing compensation. Few industry executives, in fact, have a more complex assignment than chemical industry chiefs in selecting and training executive personnel. The No. 1 chemical executive must attract and nurture a management team with both business skill and technical talent if his firm is to grow profitably.

In a utility or railroad, by way of contrast, the personnel challenge does not exist to quite the same extent. In these concerns, job functions change slowly, as do end-products and processes; dieselization of railroads, for example, was a slow process—so is the introduction of new turbines or generators.

Relatively more people are involved in decision-making in chemical firms than in other industries. Thus, a top chemical manager is faced with a formidable personnel assignment in mustering the full potential of his complex staff.

Aside from his responsibility for getting group decisions, a chemical industry president or board chairman is frequently called upon for quick decisions of his own—after reviewing highly complicated technical information, for example. Under these conditions, it's usually impossible for him to call in subordinate executives to duplicate his review, even to corroborate his decision.

Totted up, the difficulties associated with decision-making are higher than average in the chemical industry.

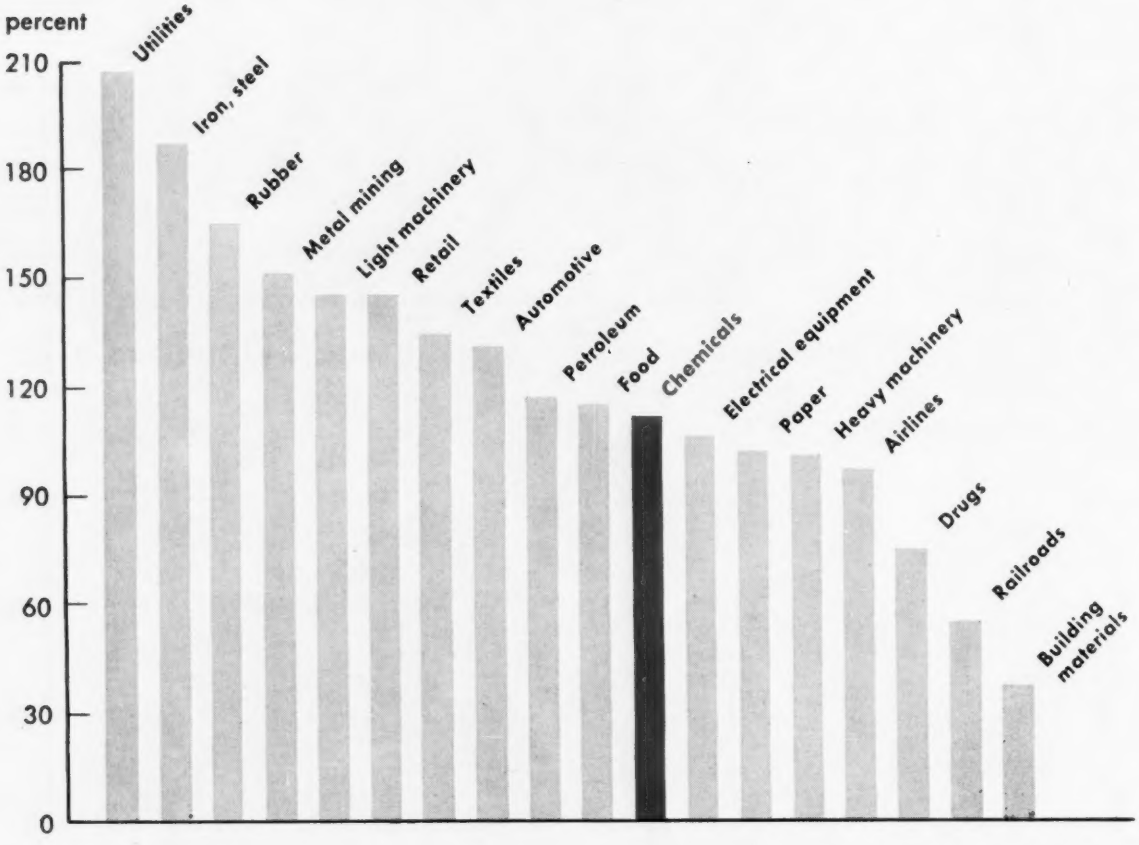
Capital outlays should be another key factor in determining chemical industry compensation. Chemical firms gamble millions of dollars on new products, processes and equipment. Often the profitability of a new manufacturing process or end-product is far from assured. Of course, the rewards for being first in the industry with a new product are often enormous.

Similar situations exist in retail businesses where high premiums are placed on astute capital-expansion decisions. A poorly selected building site, for example, can inhibit or entirely erase department-store profits.

In contrast, industries such as utilities or railroads have vast backgrounds of data on market growth and business changes to fall back on in planning capital outlays. Then, too, the risk involved in making capital outlays in these industries is small, since both utilities and railroads are, to an extent, protected monopolies having only limited competition.

When it comes to pricing goods and services, the

How Big a Reward for Bigger Profits?



Top management men in companies showing an annual profit of $40 million make more than their counterparts in firms tallying an annual profit of $3 million. The average added compensation accorded the former in 18 industries is shown here.

C W Report

chemical industry again is in a more precarious position. Pricing here is a complex problem that can encourage competition or cause profitless ventures if misjudged.

In utilities and railroads, on the other hand, rates are government-regulated. Result: pricing decisions are more or less routine management questions.

All of the factors discussed above, together with size of plant and labor force, bear on a chemical executive's compensation.

Down the Ladder: Compensation for chemical industry subordinate executives is closely linked to compensation levels of chief executives. Second-, third- and fourth-line chemical executives, however, are slightly better off than men in comparable posts in other industries.

At the latest tally, here's how these subordinate chemical executives measure up against others: the second-highest-paid chemical executive received compensation equivalent to 77% of his chief executive's compensation in 1955. This compares with 72% for all-industry. Third-echelon executives received the equivalent of 60% of the top executive's compensation, as against 59% for all-industry. Fourth-line executives received rewards equal to 59% of the chief executive's salary, compared with 52% for other industries.

INCENTIVE YARDSTICK

For each percent of increase in SALES in this industry . . .	Top management showed this average percent of change in compensation:	For each percent of increase in PROFITS in this industry . . .	Top management showed this average percent of change in compensation:
Airlines, aircraft	+ 3.00	Airlines, aircraft	+ 1.07
Retail trade	+ 1.24	Retail trade	+ 0.55
Rubber	+ 0.64	Petroleum	+ 0.38
Paper	+ 0.59	Paper	+ 0.32
Heavy machinery	+ 0.50	Utilities	+ 0.22
Petroleum	+ 0.45	Rubber	+ 0.17
Iron, steel	+ 0.44	Chemicals	+ 0.16
Textiles	+ 0.41	Automotive	+ 0.14
Chemicals	+ 0.38	Iron, steel	+ 0.13
Automotive	+ 0.37	Building materials	+ 0.13
Building materials	+ 0.28	Drugs	+ 0.13
Utilities	+ 0.28	Light machinery	+ 0.13
Light machinery	+ 0.27	Textiles	+ 0.11
Railroads	+ 0.23	Metal mining	+ 0.09
Drugs	+ 0.21	Heavy machinery	+ 0.07
Food	+ 0.20	Railroads	+ 0.07
Metal mining	+ 0.15	Food	+ 0.07
Electrical equipment	− 0.44	Electrical equipment	− 0.17

This higher-than-average compensation for subordinate executives suggests that "market or skill orientation" affects compensation at a fairly high level in the chemical industry.

Market or skill orientation is another factor (aside from company size) controlling executive compensation.

At some point down the management ladder in every industry, the effect of market or skill orientation begins to be felt. For example, a district sales manager or a plant superintendent is likely to be paid approximately the same, whether he is in a company with sales of $30 million/year or $500 million/year. Reason: at this management level, responsibilities are about the same, regardless of company size. Supply and demand determine compensation.

In the chemical industry, the requirement for specialists exists higher up the management ladder than in many other industries. For example, vice-presidents of production must be technical men; and qualifications for this job are about the same, regardless of the size of the company.

Such a situation is more or less peculiar to the chemical industry. For that reason, subordinate executive compensation fares somewhat better in the chemical industry than outside of it.

How Fringe Benefits Figure: Chemical industry executives—like so many industry leaders today—are motivated by a number of fringe benefits offered in addition to regular salary and bonus compensations.

Stock option plans, deferred compensation and pensions figure prominently among these benefits. In 1955, 51% of top chemical industry executives received stock options; 20.5% enjoyed some form of deferred contingent compensation. This compares with all-industry figures

of 47% receiving stock options, 17% receiving deferred compensation.

Another look at fringe benefits (afforded by a recent American Management Assn. survey) shows that 73% of the chemical firms surveyed offered executive pension plans, compared with 68% for industry as a whole.

Perspective: Considering all these factors, why then is the chemical industry only an average chief executive compensator? A partial answer lies in a situation that still exists in the chemical industry, yet one that has largely disappeared from most other major industries—"family management."

In a surprising number of leading chemical companies, chief executives, or members of top-management teams, or both, still belong to the original founding family. For the most part, founding families have ceased to assume sole management roles in other large industrial corporations.

Many "family" executives have substantial incomes from their ownership interest and, therefore, demand relatively smaller salaries than do professional managers in other companies where investment income is not as big a factor in total compensation. Result: a salary-depressing effect down the chemical industry management line.

A more important factor: chemical industry top management is being paid more with regard to practices of industry in general rather than to the precise management needs of chemical companies.

Whatever the cause, there is little doubt that chemical companies might profitably re-examine their policies on top-management compensation.

Reprints of this CW Report on executive compensation are available for $1 each from CHEMICAL WEEK, Reprint Dept., Room 2400, 330 West 42 St., New York 36, N.Y. Bulk rates available on request.

NEXT MONTH:

Nuclear Energy, Minus 'Gee Whiz'

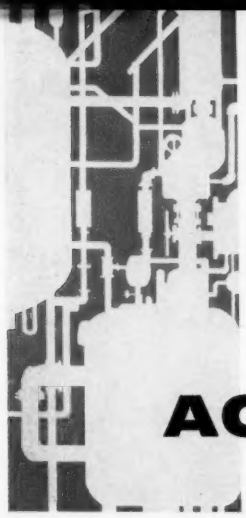
Handsome profits are waiting for takers in the nuclear energy field. But the whole subject of nuclear energy has been so fogged by fanciful speculation that chemical management men are finding it difficult to see the right spot for their firms in the over-all picture.

Catalytic Construction Co.'s Raymond E. Vener, next month's CW Report author, lifts the veil of "gee whiz" from nuclear technology, reveals, among other things:

- The importance of nuclear energy developments to chemical industry.
- How so-called "nuclear" operations are identical with chemical unit operations.
- The chemical nature of most atomic energy operations.
- Areas of participation and incentives for chemical firms in nuclear energy.

Vener doesn't talk vaguely about the future; he's concerned with making profits in today's nuclear energy market. His report digs deep, and uncovers opportunities in raw materials operations, refining processes, reactor fuel processing, waste disposal, etc.

Many chemical firms are already in one or another phase of nuclear energy. But only a small start has been made. Opportunities are legion—in peacetime applications as well as in military uses. But these opportunities won't wait indefinitely. Vener's report will help chemical companies choose their niche in nuclear energy, show how to go about filling it. Look for it in the March 9 issue of CHEMICAL WEEK.



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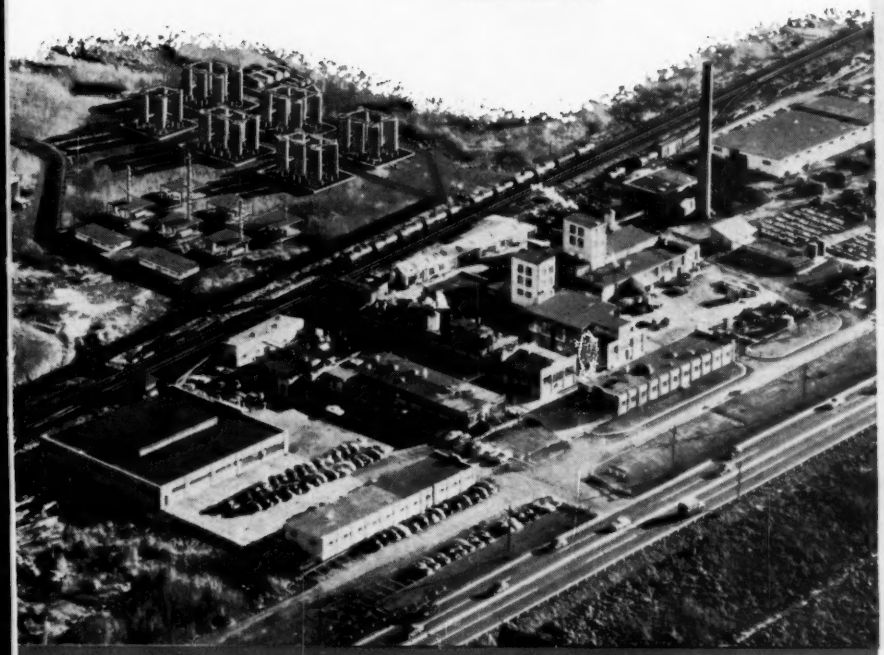

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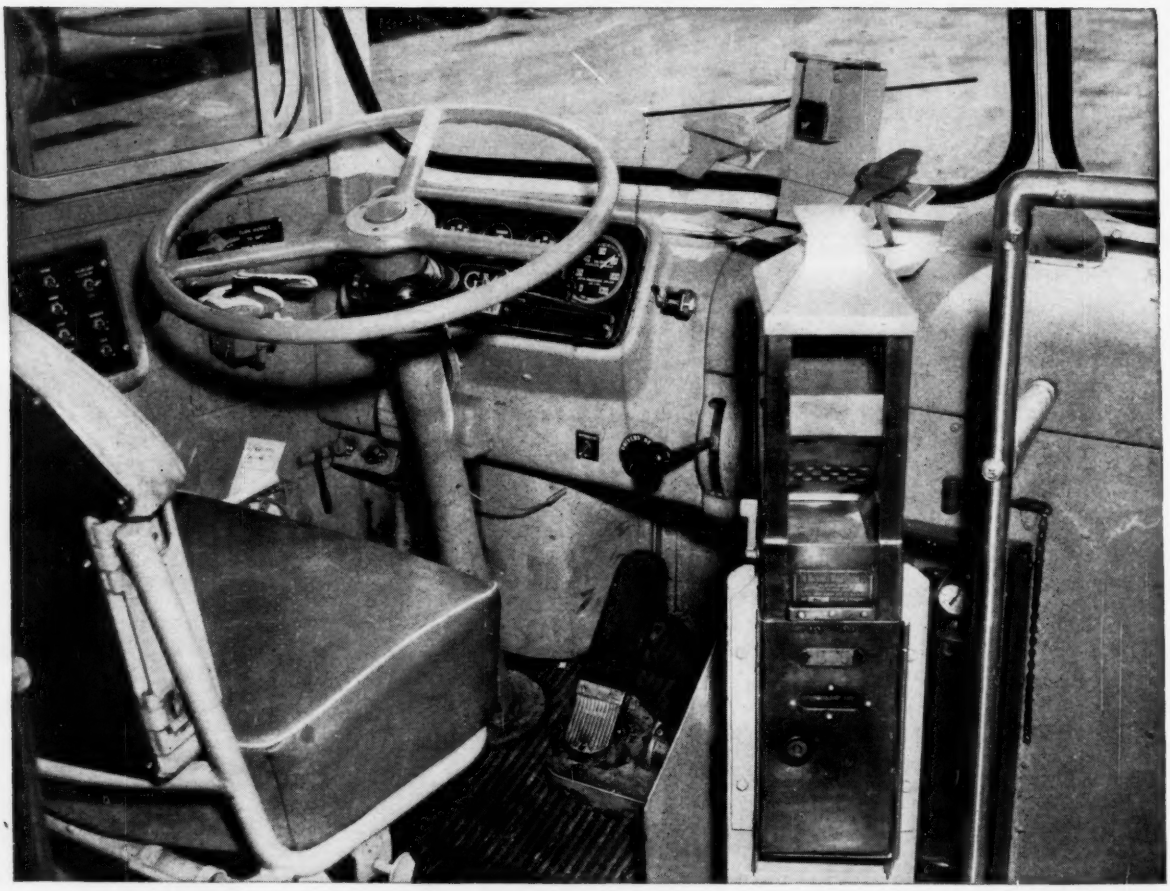


THE NEW LOOK—Fifty new 48-passenger buses for The Cleveland Transit System of Cleveland, Ohio have driver's area coated with multicolor lacquer. Multicolor lacquer used on 25 of these buses is Cook Paint & Varnish Company's "Coroflek." Multicolor lacquer on the other buses is Acme Quality Paints Inc.'s "Spat-A-Color." Multicolor is made under U. S. Patent No. 2,591,904; licensed from Coloramic Coatings, Inc., Los Angeles.

MULTICOLOR LACQUER INCREASES SAFETY, IMPROVES APPEARANCE

Multicolor lacquer, based on Hercules® nitrocellulose, is now being used by an ever increasing number of progressive bus lines to combine safety with a decorative touch. Used in the driver's area, multicolor prevents glare and reflection from sun, headlights. Yet multicolor also offers all the other advantages you seek in a protective coating.

Easy to apply, this low-cost coating is quick drying to cut down on down time for rolling stock. It can be applied over rough surfaces that do not need to be highly sanded or polished. And multicolor not only cleans quickly but remains clean longer. It's the perfect finish to change a drab interior into a colorful but safe area.

Multicolor coatings are available from many paint companies. For additional technical information and the name of your nearest supplier, just write Hercules.

FERTL'S CATLIN: He's first to exploit research as . . .

Gibberellins Go Commercial

Two gibberellin products are on the market this week. They're in the vanguard of what, in future weeks, is sure to be a flood of products that make use of the growth-stimulant properties of gibberellic acid and its derivatives (*CW Technology Newsletter, June 26, '56*).

First to be introduced: 3F Foliar Spray, a material packaged for home-gardener use by Fertl, Inc. (South Norwalk, Conn.). Second: Gibrel, a potassium salt of gibberellic acid that's being made available to formulators of plant foods by Merck, Inc. (Rahway, N.J.).

While Merck made its announcement through normal publicity channels, Fertl (which buys its gibberellic from Imperial Chemical Industries) put its product on the market unnoticed. First word came in an advertisement buried in the garden section of the New York *Times* a few weeks ago—and only the slightest reference was made to the fact that 3F Foliar Spray did contain the growth stimulator.

Most of the claims for the spray, however, are based on the chemical's action. (Fertl's president, Hoyt Catlin, told *CW* that his product is "not a fertilizer, but sort of a tonic to stimulate the appetite—like Geritol.") Catlin, not a technical man, has relied on a consultant, Robert Zuck, botanist at Drew University (Madison, N.J.), for much of the developmental work on his product.

The 3-F spray is now being sold exclusively by mail order, although it's expected to be distributed soon to retail stores. Gardeners ordering the material get a polyethylene spray bottle and three small white blotters, which have been impregnated with a solution containing gibberellins, and then dried. A portion of the blotter is dropped into the bottle, water is added and the spray is ready to use. Price of this combination: $1.

$40 a Gram: Fertl is presently paying ICI about $40/gram. This seemingly prohibitive price is actually of little consequence. Such small quantities of the material are needed to treat plants that labor is still Catlin's principal cost. Out of every gram of gibberellin, Catlin can get enough solution to make almost 7,000 of the blotter combinations.

Catlin's exploitation of gibberellin and Merck's announcement may have caught many researchers unawares. The other U.S. companies supplying the material have been issuing only research quantities; most figured that commercial application is at least a year away.

Clearance Concern: Although gibberellin will find an enthusiastic market awaiting it among housewives eager to use it on house plants and cut flowers, the big field will undoubtedly be in the agricultural applications, though here questions of clearance under the Food, Drug & Cosmetic Act arise. Since the material is not a pesticide under definition of the Miller amendment, its use on food crops would depend on whether it could meet the provisions of Section 406 of the food and drug law itself. If it left a residue on a crop that couldn't be proved not to be poisonous or deleterious, its use could leave a user open to action by the Food & Drug Administration. So far, however, toxicity doesn't appear to be a problem.

What makes the material attractive is the fact that it can be applied in a variety of forms, is needed in such minute quantities—one acre can be satisfactorily treated by one gram of gibberellic acid.

Punctured Drum: All the ballyhoo that's bound to come in the near future may not sound sweetly in the ear of many researchers. *CW* checked with a number of them. All were quick to endorse the product's potential—but with reservations.

Said one: "Additional field testing is necessary before definite recommendations can be made. Where agricultural use is concerned, there is a problem of quality as well as quantity—if a crop's taste or texture suffer, the stimulant is of questionable value."

Another, working on applications in ornamental flowers and shrubs is somewhat pessimistic on broad applications of the acid, either for flower or crop use. He thinks commercial florists will most likely be first to use gibberellin in flowering their expensive hothouse crops.

Soapmakers Get Together

The trio* above, along with some 1,100 others who talked to each other about soap, detergents and related subjects at New York's Waldorf-Astoria recently, got a broad picture of what's happening in important chemical specialty fields.

Those who attended the 30th annual meeting of the Assn. of American Soap and Glycerine Producers heard news about washday trends that will affect future detergent formulations, facts and figures on grocery sales of detergents, and a progress report on sewage foam problems caused by detergents.

Cold and Shorter: Current trends in home laundering were outlined by Doris Hanson, associate editor of *McCall's* magazine. Among coming changes in laundry practices that might affect future wash product formulation: more use of cold water in washing and rinsing; greater emphasis on shorter washing cycles, slower washing action; increasing use of rinse additives. She also pointed out the need for standardization of procedures for both washing and machine-drying synthetic fibers and fiber blends.

Pounds, Not Prices: Basic trends in grocery-store selling applying to soap and synthetic detergents were covered by Burton V. LeVee, vice-president of A. C. Nielson Co. Among a raft of figures quoted by LeVee, these stood out:

- In '56, dollar volume for household detergents reached a new high, 9% over the year before, 44% above the level of 1950—with most of the hike due to increased poundage consumption, not to price increases.
- New products in packaged detergents accounted for 75% of the growth in that field since 1953. These same products accounted for 20% of total grocery-store sales of all brands of packaged detergents.
- Stock turnovers are increasing. In '56, inventories were turning 8.2 times annually, up from 7.2 in '54, 6.7 in 1950.

Also of interest to detergent marketers were LeVee's figures on the changing physical characteristics of retail grocery stores. He figures that roughly 47,000 stores control more than 70% of the grocery-store business in the U.S. By 1960, predicted LeVee, only 37,000 outlets will do this 70% of the business.

On the subject of pioneering a new product, LeVee pointed out that in 14 out of 17 cases he studied, the first product on the market became the most popular. In almost all cases, the innovator was leading its followers by substantial margins after three years on the market—usually 2 to 1 over the second brand, 4 to 1 over the third.

* Above, from left, W. H. Burkhart, president of Lever Brothers, William M. Martin Jr., Federal Reserve Bank Chairman, and Roy W. Peet, AAS&GP manager.

SPECIALTIES

An interesting sidelight to the subject of pioneering is the fact that while the initial investment for the pioneering company usually proved high, the pioneer's advertising cost-sales revenue ratio usually became quite favorable to him.

Fight on Froth: Describing research being carried on at four universities on the problems associated with synthetic detergents in sewage and water treatment, Monsanto's Henry Moss reported encouraging progress, but urged continuation of the AAS&GP-initiated program. Current investigation, according to Moss, indicates that alkylbenzene sulfonates in concentrations now present in sewage do not affect bacterial life nor otherwise significantly affect efficiency of operation of a sewage plant: the problem is primarily one of frothing.

It's apparent, continued Moss, that the sulfonate in raw sewage is not completely eliminated by existing conventional sewage treatment, and some proportion goes off through the effluent in its original or a partly degraded form. With closer control of operations in a sewage plant, greater sulfonate removal can be effected.

Little hope was expressed that the special strains of bacteria that are able to decompose sulfonates can now be cultured in effective concentrations in sewage plants.

Phosphates, given increasing attention as possibly interfering with water-treating operations, are being cleared of that charge, according to Moss. Accumulating evidence, he declared, indicates that the reputed offenders—polyphosphates—do not become sufficiently concentrated in raw water to pose a real problem.

Cut-Rate Fluoridation

To speed the adoption of a mechanism that will cut the cost of fluoridating water supplies, the U.S. Public Health Service will offer royalty-free patent licenses on a device that makes practical the use of the natural—and cheaper—calcium fluoride-containing material for fluoridation.

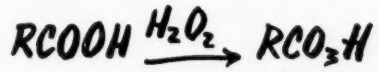
Use of fluorspar—by far the cheapest suitable source of fluoride—as a water fluoridating agent has been impeded because it is insoluble when fed to water in ordinary equipment. This drawback has now been overcome in the new piece of waterworks equip-

You Get a Fast Start in a Wide Range of Organic Reactions with Albone®

hydrogen peroxide

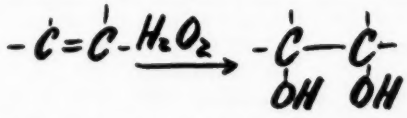
When properly activated, "Albone" hydrogen peroxide is a highly effective oxidizing agent for organic synthesis. Here are a few examples of the possible uses for Du Pont hydrogen peroxide in organic reactions:

Peracid Formation. When hydrogen peroxide is activated by forming a peracid, its reactions are often faster—yields are often higher.



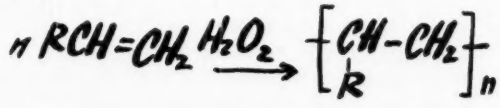
Detailed information on preformation of peracetic acid is available from Du Pont.

Hydroxylation. Olefins are converted to glycols by hydrogen peroxide although epoxides and derivatives may be formed first in the reactions.



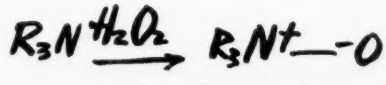
Long-chain glycols and derivatives have value as plasticizers and modifiers in coatings, rubber, plastics and emulsifiers.

Polymerization. Hydrogen peroxide, usually employed in emulsion techniques, initiates the polymerization of a variety of unsaturated monomers.



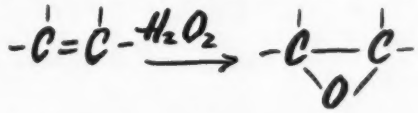
The polymers formed have been useful as rubber substitutes, adhesives, plastics and coatings.

Nitrogen Oxidation. Tertiary amines are oxidized smoothly to nitrogen oxides in the following reaction:



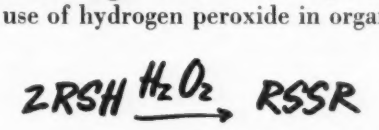
N-oxides are useful as therapeutic agents.

Epoxidation. The epoxidation reaction has simplified the conversion of fatty oils and derivatives into useful and profitable products.



Epoxides are useful as plasticizers, stabilizers, insecticides and drugs . . . have many possibilities as lubricants, coating constituents and chemical intermediates. Du Pont has developed several efficient procedures for epoxidation. Complete information on these procedures is readily obtained in a booklet available from Du Pont.

Sulfur Oxidation, Quinone Formation and Ketone Cleavage are other examples of propitious use of hydrogen peroxide in organic syntheses.



Certain sulfur oxidation products have shown antimicrobial activity. Suggested uses for the products of sulfur oxidation have included fungicides, insecticides and rubber accelerators.

Du Pont's long experience in the manufacture and use of "Albone" can help you in developing potential applications for Hydrogen Peroxide. Call or write: E. I. du Pont de Nemours & Co. (Inc.), Electrochemicals Department, Wilmington 98, Delaware.

ALBONE®

HYDROGEN PEROXIDE

Prompt Delivery in Drums and Tank Cars

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Better Things for Better Living . . . through Chemistry

ment designed by two USPHS men, Franz Maier and Erwin Bellack. In the apparatus, solid calcium fluoride is dissolved in an alum solution. This resultant liquid is then fed into the water by a standard solution feeder.

Results of a six-month trial of the new device at Bel Air, Md., point to considerable cost savings for water works. According to USPHS, use of fluorspar in its device can reduce a city's average cost of fluoridation to 3¢/person/year. This is about a third of the average cost per person at installations that feed sodium silicofluoride, the most commonly used material.

Besides the savings in dollars, fluorspar has another advantage over currently used fluorides. As a natural material, it answers the objections of fluoridation foes opposed to adding "manufactured" chemicals to public drinking water.

Flexibility Pays Off

Necessity proved to be the mother of investment recently when Valley Products Co. (Philadelphia) leased the plastic-bottle-making machinery it needed to put itself in the business of making squeezeable bottles.

Valley's purpose: to insure itself an adequate supply of such bottles—something some small producers say they can't always get from major container suppliers. Now, it has done so well producing the squeeze units that it has set up a new division, Lawrence Plastic Container Co., to do battle with the "big three" of the flexible-bottle industry—Plax, Imco and Continental Can. Valley, working around the clock, is currently turning out 20,000 to 50,000 units per 24-hour day. At present, it is offering 5 different sizes, ranging from 1 to 32 oz. in size. It's increasing the size range by about two a week, and plans to be marketing 40 different sizes by March 1.

Small specialty manufacturers and filling houses now have another source of squeeze-bottle supply, and Valley plugs its ability to provide fast delivery on all orders for fewer than 100,000 pieces.

Valley will continue to package its own chemical specialties—items such as white-wall tire cleaners, car polish, lubricants, etc.—but plans are to give the bottle-making activity increasing prominence.

CHEMICALS OUTLOOK

February, 1957

This news bulletin about Wyandotte Chemicals services, products, and their applications, is published to help keep you posted. Perhaps you will want to route these and subsequent facts to interested members of your organization. Additional information and trial quantities of Wyandotte products are available upon request . . . may we serve you?

NEW POLYETHERS OFFER LOWER COST, INCREASED LIFE OF POLYURETHANE FOAMS

A new series of special polyethers, for use in the manufacture of polyurethane foams, has recently been developed at Wyandotte. Results indicate that foams made with these polyethers can be manufactured at a substantially lower cost, and will have a longer life.

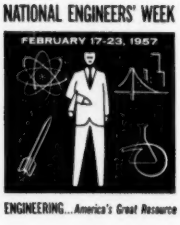
These polyethers are specially selected members of Wyandotte's Pluronic* and Tetronic* series of block-polymers. They are based on propylene and ethylene oxides with molecular weights ranging from 2000 to 6000. Both flexible and rigid polyurethane foams, of excellent appearance and promising properties, are being prepared using these polyethers and toluene diisocyanate.

Two major automobile producers are already using crash pads made from Wyandotte's polyurethane-grade polyethers . . . other automotive uses are under evaluation. The furniture industry will find widespread use for such foams in mattresses and other forms of cushioning. The floor-covering industry is considering them as permanently affixed underlayers for carpeting.

Other applications under consideration include: combination structural-insulating material for refrigerator and air-conditioning unit shells; sandwich materials for various aircraft components; structural-insulating innerliners for metal walls, doors, and other products in construction of modern buildings.

Preliminary experiments indicate that these polyethers may be of interest in the development of polyurethane films, coatings, adhesives, and elastomers. For further information, please write on your company letterhead.

* * *



The week of February 17-23 has been set aside as National Engineers' Week, and is sponsored by the National Society of Professional Engineers. The theme for observance in 1957 is "Engineering . . . America's Great Resource"—chosen because of the belief that the real resources of this country are found not merely in the elements buried in the earth, but more especially in the minds and attitudes of the people.

*REG. U.S. PAT. OFF.

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SPECIALTIES

Fuzz-ball Finale?

Sweaters and other garments made of Orlon and Acrilan can be made permanently "pill"-resistant with a new finish, named UT-Formula. That's the claim of its developer, Universal Dye Works (Philadelphia).

Universal's research department began work on the project in Aug. '56, came up with the formula far sooner than it had expected. The firm will immediately begin using the UT-Formula to finish work for customers making shirts and sweaters constructed from high-bulk Orlon or Acrilan.

CW checked with companies interested in the successful development of the product and known to have done some work with it. Most of them were enthusiastic.

PRODUCTS

Waterless Shampoo: Clayton Specialty Mfg. Co. (Chicago) has introduced its Lady Anne Waterless No Rinsing Hair Bath. The liquid is massaged into hair, wiped off, applied again and wiped off. The maker reports that while cleaning hair, it won't remove hair oils. An 8-oz. glass bottle costs $1.

•

Marks for Safety: Sensitive crayons for detection of such toxic gases as phosgene, hydrogen cyanide, cyanogen chloride, cyanogen bromide and lewisite are now available for civilian applications from Aromil Chemical (Baltimore, Md.). Crayon marks on paper, wood or most other surfaces turn color when exposed to low concentrations of appropriate gases.

•

Inhibitor: Garman Co. (St. Louis) has a new inhibitor, Vapco-Hib, which it claims permits the use of strong, quick-acting acids for removing scale from metal surfaces without danger of excessive etching. Eight ounces of inhibitor is added to each gallon of 18 Baumé hydrochloric. It's available in 8- and 32-oz. sizes.

•

Protective Coating: For protection of buildings and equipment in refineries, chemical plants, smelters, West Chester Chemical (West Chester, Pa.) has devised Maintz, a new coating based on Du Pont's chlorosulfonated polyethylene. Standard colors in which it's supplied are white, black and gray; custom colors include a wide variety of pastels.

THE PLENTIFUL RARE EARTHS

some facts about a clubby clan of elements that are rare in name only

a report by LINDSAY

We got to thinking the other day that perhaps a lot of industry folks are passing up a diamond-studded opportunity because they believe the rare earths are unavailable in commercial tonnages. Nothing could be farther from the truth. Rare earths are *not* rare! Commercial salts of the rare earths are available, right now, for prompt shipment in quantities from a gram to a carload.

That the rare earths are so plentiful is due, in large part, to Lindsay. During the last 50 years, Lindsay has developed the extraction and separation of rare earths to a high degree.

New equipment and processes are now in operation at Lindsay's West Chicago plant and are producing greater quantities of these versatile materials in higher purities than before.

FROM 57 THROUGH 71—Some chemists call rare earths Lanthanides, Lanthanons or the Lanthanum Series. Actually they are not earths, but trivalent metals, a rather amazing family of elements . . . atomic numbers 57 through 71. They are grouped together because they are always found together, with thorium and yttrium, in ores such as monazite, and all have closely related properties. While rare earths are technically metals, Lindsay produces them in chemical salt forms—individually or in combinations.

ATOMIC NUMBER	ELEMENT
39	Yttrium
57	Lanthanum
58	Cerium
59	Praseodymium
60	Neodymium
62	Samarium
63	Europium
64	Gadolinium
65	Terbium
66	Dysprosium
67	Holmium
68	Erbium
69	Thulium
70	Ytterbium
71	Lutetium
90	Thorium

SOME USES FOR RARE EARTHS

LANTHANUM—As lanthanum oxide in a high refractive optical glass, particularly for aerial cameras and other instruments.

CERIUM—Glass polishing. Scavenger in explosives production. Radiation protection glass for atomic reactors. Opacifier for porcelain. Oxidizing catalysts in organic preparations. Ultraviolet light absorber.

MIXED RARE EARTHS—Misch metal for lighter flints and alloy uses. Motion sickness medication. Cores of arc carbon electrodes. Aluminum and magnesium alloys.

PRAESODYMIUM & NEODYMIUM—Dichroic colorants for ceramic glazes and glass. Used in better grade sun glasses. They do not lower light permeability and index of refraction when used as colorant or decolorizer. Ceramic capacitors.

The rare earths are becoming increasingly important in the production of steel and steel alloys. Small quantities added to the metal in the ladle result in a strong, fine-grained steel. Steel thus treated has great resistance to low temperature oxidation and corrosion. Stainless varieties have better hot and cold workability. Silicon and electrical grade steels have better electrical qualities.

Rare earths added to cast iron act as powerful deoxidizers and help remove sulfur from the molten metal. They are responsible for cast iron that is resistant to scaling at higher temperatures and to certain corrosive atmospheres. In malleable metals, they act as a carbide stabilizer.

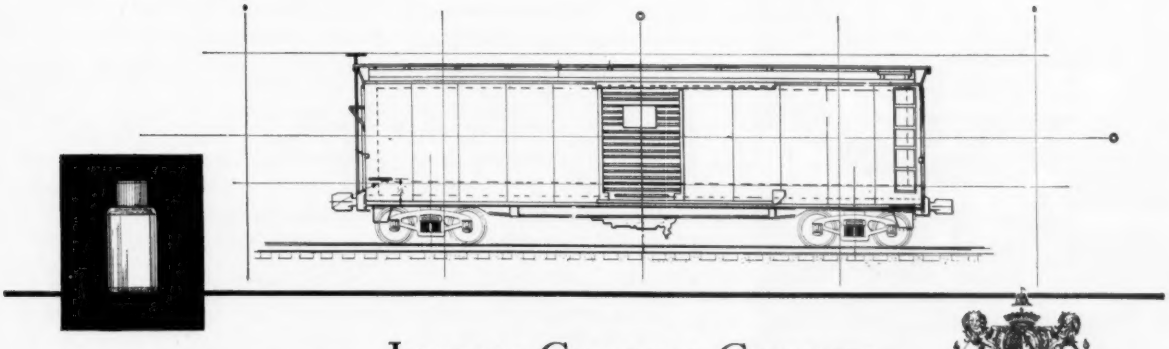
Magnesium-rare earth-zirconium alloys have excellent casting qualities and mechanical properties that make them ideal for important light-weight stressed components of aircraft engines.

Other rare earth compounds are used extensively for waterproofing, mildewproofing, weighting and dyeing of fabrics and compounding printing inks and phosphors.

LIKE AN ICEBERG—You might compare uses for the rare earths to an iceberg. What you see is only a small part of what lies undiscovered under the surface. In all probability, there is a real place for one or more of the rare earths in your operations. New uses—and profitable ones, too—are being discovered constantly. These versatile elements offer so much promise in so many different ways they merit your investigation.

To industries interested in the rare earths, we offer detailed technological data compiled over the years by our research staff. We will also furnish samples for experimentation.

And please remember . . . the rare earths are *plentiful*. Lindsay can supply you with quantities from a gram to a carload.



PLEASE ADDRESS INQUIRIES TO LINDSAY CHEMICAL COMPANY

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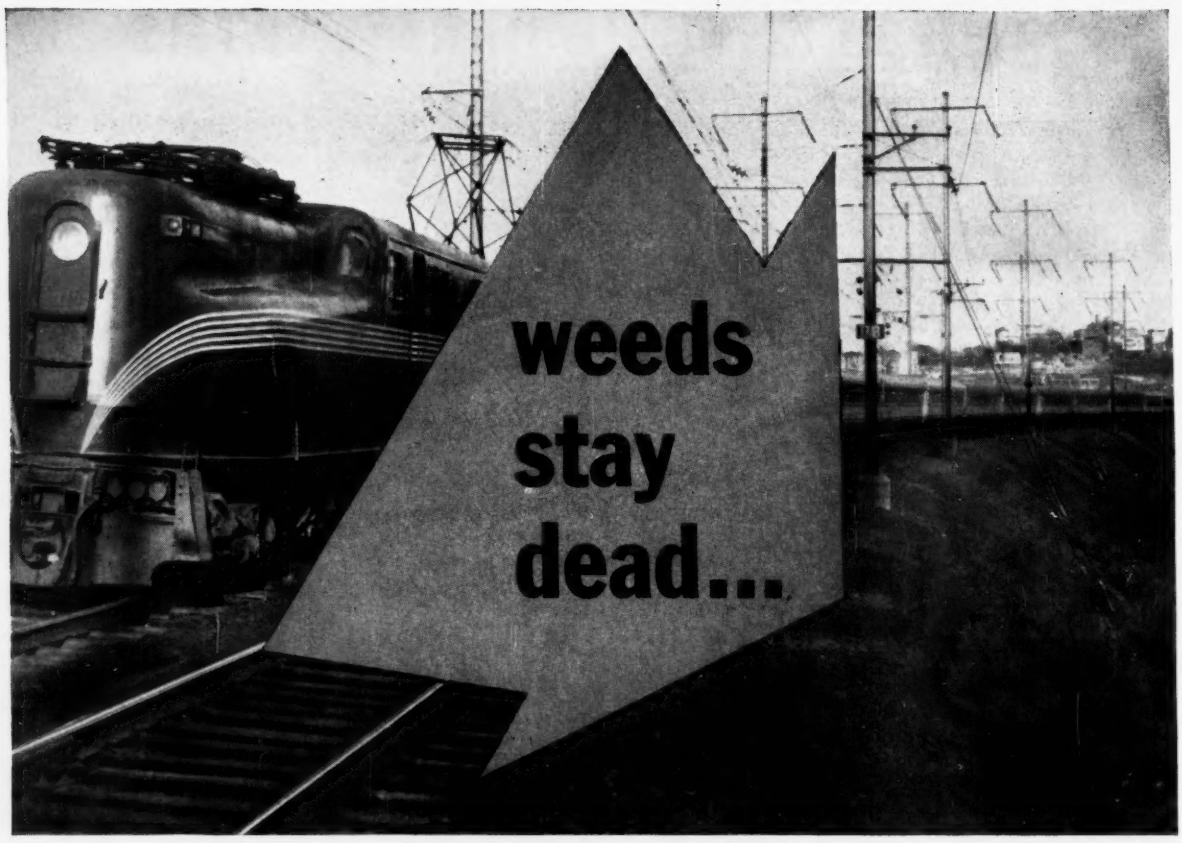

...when you formulate 2,4-D and 2,4,5-T Esters of Butoxy Ethoxy Propanol

In Canada: Carbide Chemicals Company, Division of Union Carbide Canada Limited, Montreal.

CARBIDE AND CARBON CHEMICALS

Carbide and Carbon Chemicals Company
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Here's how your product benefits:

1 These esters are low in volatility. This insures maximum efficiency in weed and brush control plus minimum danger from vapor damage to sensitive crops.

2 Esters are approved for use in control of weeds in small grains and general weed and brush control.

3 Formulating problems are reduced. These esters are mobile liquids at normal temperatures. They are also miscible in all proportions with aromatic and aliphatic hydrocarbon solvents.

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- 2-Ethylhexyl alcohol, butanol, and isobutanol—for esters of 2,4-D and 2,4,5-T
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For information or samples—write today to Carbide and Carbon Chemicals Company, Room 308, Dept. H, 30 East 42nd St., New York 17, N. Y.

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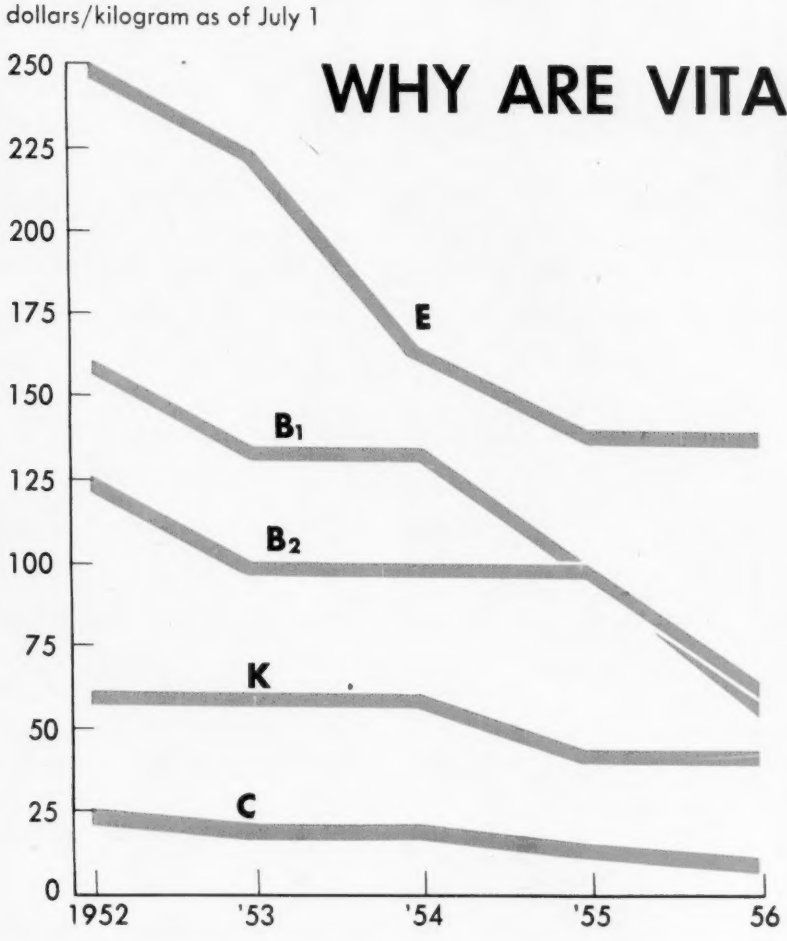


WHY ARE VITAMIN PRICES TUMBLING?

Producers charge: "Imports are forcing price cuts"

Importers reply: "Imports are small. Competition is the reason"

Vitamin Makers Split on Prices

Among pharmaceuticals, vitamins are second only to antibiotics in production and sales. And the vitamin business this week is split by a vexing question: Who's to blame for the prolonged plummeting of prices? Polemic lines are sharply drawn: domestic producers point accusingly at increased imports; importers, while conceding that shipments into this country have had some effect on the market, insist that the over-all impact is negligible.

No help in resolving the issue is the fact that, although prices on the "big time" vitamins have remained relatively stable the last six months, U.S. producers and importers are reluctant to even guess whether the leveling of prices will hold or whether it's just a temporary pause before a plunge.

Producers' Predicament: Domestic producers are vociferous in their claims that increased imports are the direct results of the revitalization of foreign pharmaceutical industries over the past five years and indicate considerable success of European and Far Eastern countries in their attempts to regain world outlets.

These campaigns (particularly Japanese and German), U.S. makers charge, flood the U.S. with large quantities of vitamins at lower-than-domestic prices.

For example, U.S. producers point out:

- In 1955, an estimated 30,000 lbs. of vitamin B_1 (equal to 14% of domestic production for that year) was imported. The following year, imports jumped to over 42,000 lbs., equal to about 18% of total thiamine hydrochloride produced in the country.
- Imports of ascorbic acid have shot up just as rapidly, and some observers say there's apparently no slowdown in sight. In '54, more than 200,000 lbs. was brought into the country. Last year, vitamin C imports skyrocketed to 400,000 lbs.—a 100% increase in two years.
- Niacin imports today are registering a sizable 120,000-lbs./year rate. Four or five years ago, niacin imports were negligible.

Pointing up the concern this foreign influx has caused among manufacturers, two well known pharmaceutical houses have asked for, and are paying

Continued on p. 78

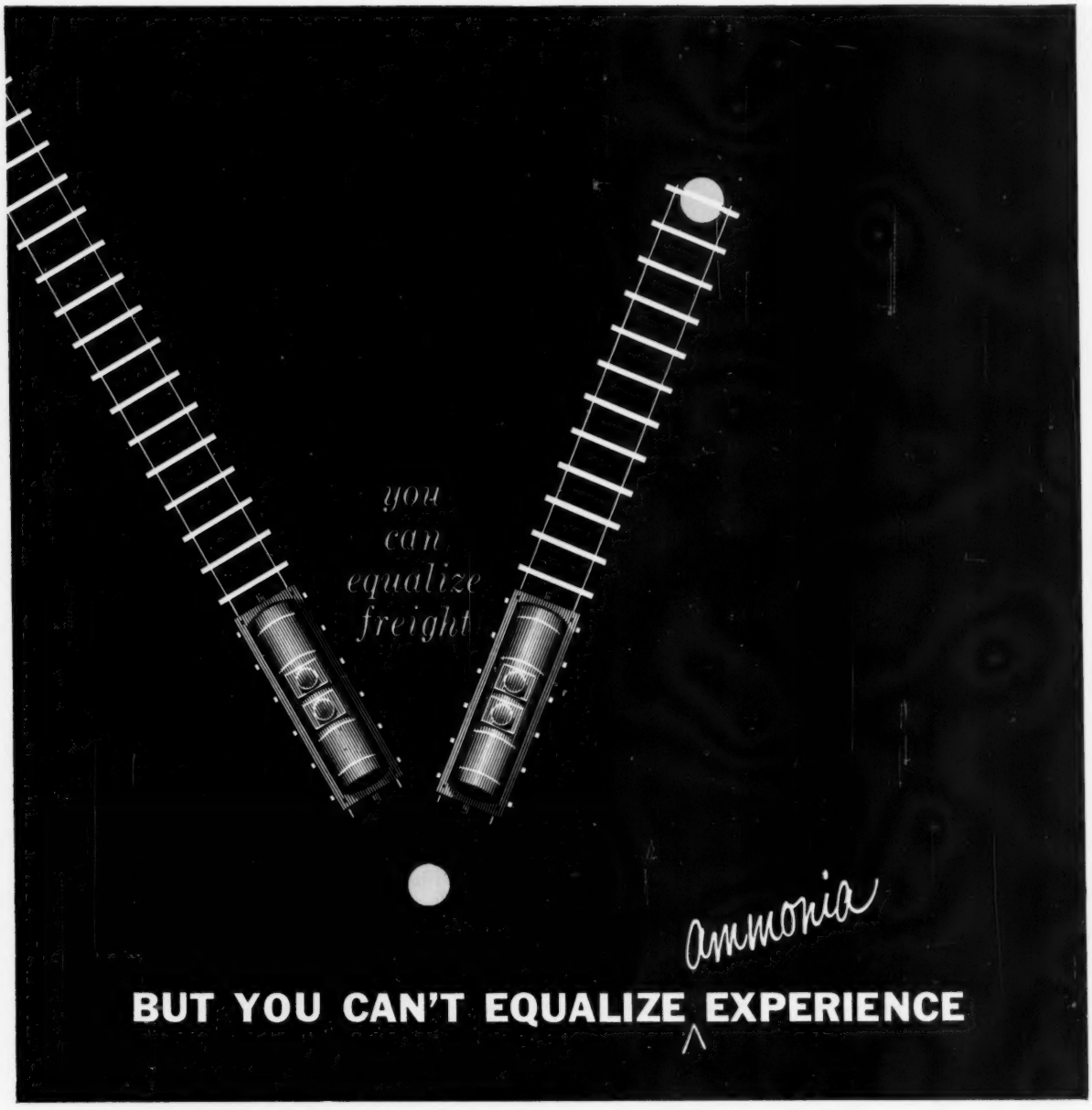
U.S. Vitamin Production Goes Up . . .

	1950	1952	1954	1956 (est.)
A (alcohol and esters, all sources), billion USP units	26,890	73,332	103,845	200,000
B_1 (thiamin hydrochloride), lbs.	237,400	224,000	259,000	225,000
B_2 (riboflavin), 100% basis, lbs.	199,000	236,000	278,000	300,000
B_6 (pyridoxine), lbs.	17,500	14,000	24,000	40,000
B_{12}, all grades, lbs.	———	94	422	600
C (ascorbic acid, derivatives), lbs.	1,227,500	1,405,000	1,834,000	2,750,000
D_2 (irradiated ergosterol), billion USP units	30,346	26,447	26,400	30,000
D_3 (irradiated animal sterols), billion USP units	23,000	22,611	24,731	25,000
K and derivatives, lbs.	(in "all others")	1,000	6,000	4,000
Niacin, niacinamide, lbs.	1,447,600	2,122,000	2,206,000	2,300,000
Pantothenic acid and derivatives, lbs.	155,400	257,000	458,000	750,000
All others (alicyclic and heterocyclic), lbs.	72,000	411,000	435,000	300,000

As Market Price Levels Tumble

	1950*	1956*
A (acetate cryst.), million USP units	24¢	14.5¢
A (palmitate cryst.), million USP units	24¢	10¢
B_1 (thiamin hydrochloride), kilogram	$160	$60
B_2 (riboflavin), kilogram	$125	$65
B_6 (pyridoxine), kilogram	$550	$375
B_{12}, kilogram	$985,000	$245,000
C (ascorbic acid), kilogram	$25	$12
D (calciferol cryst.), kilogram	$1,900	$600
E (alpha-tocopherol acetate), kilogram	$350	$136
K (menadione), kilogram	$65	$44

*as of July 1st.



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the costs of, a special survey by the U.S. Tariff Commission to keep monthly tabs on the amount of vitamin C and B_1 entering the country.

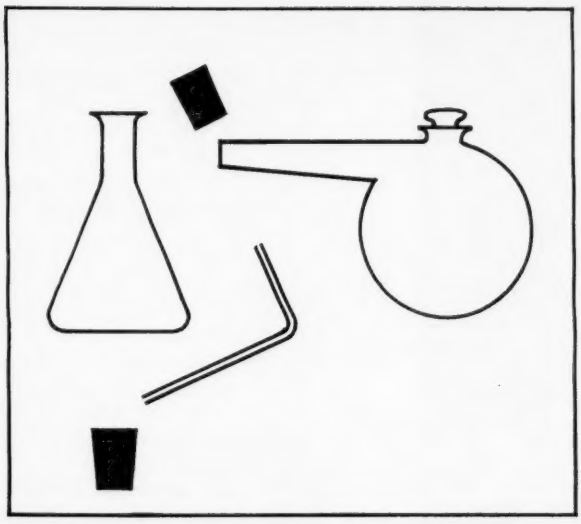
Nicked by such competition, harassed manufacturers have drastically slashed vitamin prices to stem the tide of foreign material. In 1952, vitamin B_1 sold for $160/kg.; last year, the asking price was $60. In '52, ascorbic acid was sold for $25/kg.; during '56, buyers could get the product for half that price.

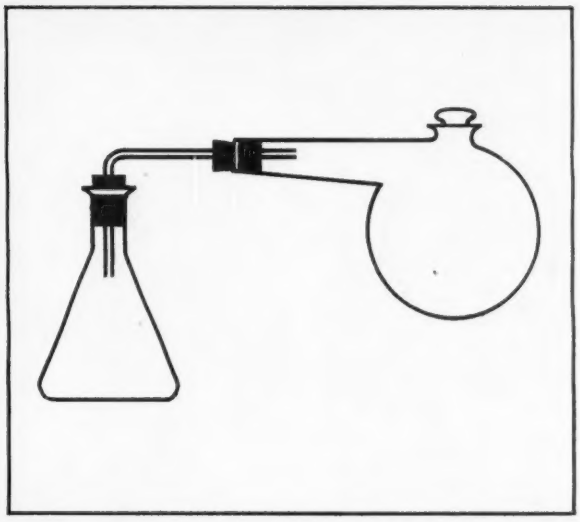
These price-cutting tactics, which U.S. producers claim they were forced to adopt as a defense against swelling imports, have led, in the words of one maker, to "killing the goose that laid the golden eggs." And there's been another result: today, it's the importer who's feeling the price pinch. Spokesmen for the Japanese vitamin industry, for instance, have expressed doubts that they could further cut their vitamin prices to successfully compete with domestic U.S. schedules. But, while producers and importers hope there will be no further price-slashing, some admittedly are ready to wield the pencil again if "the situation warrants it."

Importers' Rebuttal: Importers have been quick to deny that their operations over the past few years have been solely to blame for the depressing of prices. "Unfair and not the true picture" is their answer to such charges. One rebuttal: vitamins were overpriced to begin with. A major importer tells *CW* that U.S. vitamin manufacturers were "making hay while the sun shone." "If the clouds that cast a shadow on the 'hay making' were foreign countries," he adds, "it's because they [overseas manufacturers] were in a position to offer vitamins to U.S. buyers at more reasonable price levels."

"These earlier unnecessarily high prices," other importers insist, "would have fallen despite the foreign influx." Reasons: stepped-up U.S. production; increased demand for across-the-counter sales; expiration of production patents; increase of higher-potency vitamins; lowering of production costs.

Importers readily admit that vitamin B_1 and ascorbic acid prices were directly affected by the competitive products from Japan, Germany, France and Denmark. But, and they stress this, "How can one account for the equally radical price changes in





Where was the starting point?

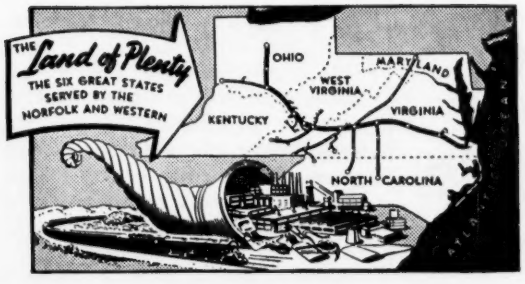
(chemical plant location reduced to its simplest formula)

Laboratory apparatus is designed so there's a stopper for every flask, glass tubing to fit the hole in every stopper. They were planned that way — to fit together. But there was a starting point. Nobody ever designed a retort to fit a stopper.

Architects and builders can fit a plant to a plant site, or even alter the plant site to fit the plant. But in planning for that new plant, *finding the site needed is the starting point.* Important factors such as manpower, industrial power and water, nearness to markets, nearness to limestone and Bituminous Coal, favorable tax structures, etc., are beyond the control of architects and builders. And yet these factors determine the location of your plant and affect all other planning. The simplest formula for efficient chemical plant location is *Find Your Ground — Then Build From The Ground . . . Up!*

LET US HELP YOU PLAN YOUR NEW PLANT FROM THE GROUND UP

N&W plant location specialists, including men with chemical career experience, are at your service without obligation, quickly and quietly. Let them help you at *The Starting Point* — let them help you do the *groundwork.*



Write, wire or phone:

L. E. Ward, Jr., Manager
Industrial and Agricultural Dept.
Drawer CW-748 (Phone 4-1451, Ext. 474)
Norfolk and Western Railway
Roanoke, Virginia

Norfolk and Western RAILWAY

vitamins that have no competition from foreign makers?"

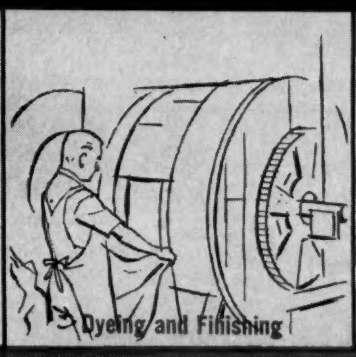
During July '50, riboflavin sold for $125/kg.; last year, that vitamin could be bought for $65/kg. (*see chart, p. 76*). Pyrodoxine sold for $550/kg. in 1950; last year, the asking price was $375. Vitamin K went from $65/kg. six years ago, to $44/kg. In 1950, vitamin B_{12} listed at $985,000/kg.; in '56, it was $245,000/kg.

Furthermore, not only has production of all vitamins climbed heartenningly (*see chart, p. 76*), but exports too, are showing healthy gains. U.S. outgoing shipments of ascorbic acid for the first nine months of '56 were up 69% over the previous year's nine-month total. Vitamin B_1, for the same period, registered a 6,000-lbs. increase over '55's exports. Importers argue that "had the foreign influence of insurging vitamins been as great as U.S. manufacturers claim, the impact would definitely have been seen in both U.S. production curves and in exports."

Both sides agree that total vitamin imports into the U.S. currently total 5-7% of domestic production; the diverging opinions come when spokesmen for both sides evaluate how big a threat these incoming vitamins pose to the nation's pharmaceutical industry.

Up, Up and Up: In spite of increasing imports and price wars, vitamins today rank high in both production and sales. Last year, value of vitamins sold was estimated at $90 million. Production of vitamins has been just as peppy, with close to 7 million lbs. being turned out annually by domestic producers. And the outlook? Rosy. Reasons: nudged by strong promotional campaigns, vitamin sales (over the counter and mail orders) are climbing; use of more concentrated forms are increasing; vitamins, as diet supplements, are becoming more widely accepted. And the industry is also eyeing other outlets that promise to deliver as solid a boost to near-future consumption figures.

The sum of these demands, say market followers, should, within the foreseeable future, easily absorb available vitamin supplies, whether produced in the U.S. or brought into the country. Furthermore, despite the battles of the past few years, lowered prices have proved a boon to the industry; they have helped open new markets, have been directly responsible for a spurt in consumption.



Suggestion for a surfactant processor who can see profit in these pictures

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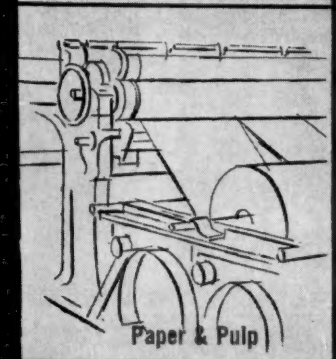

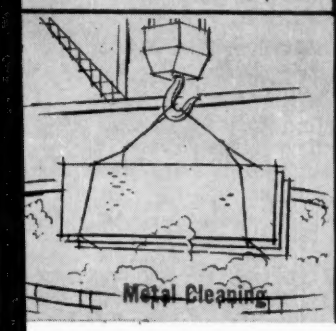

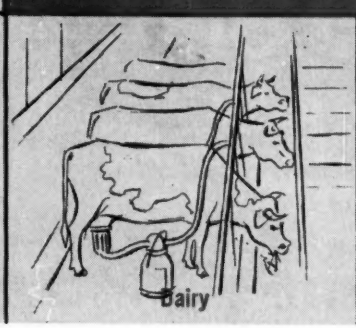

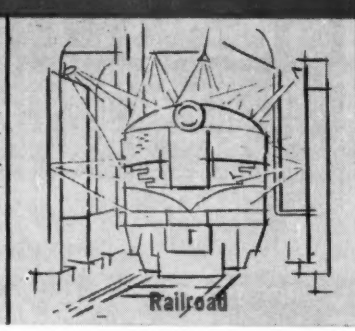

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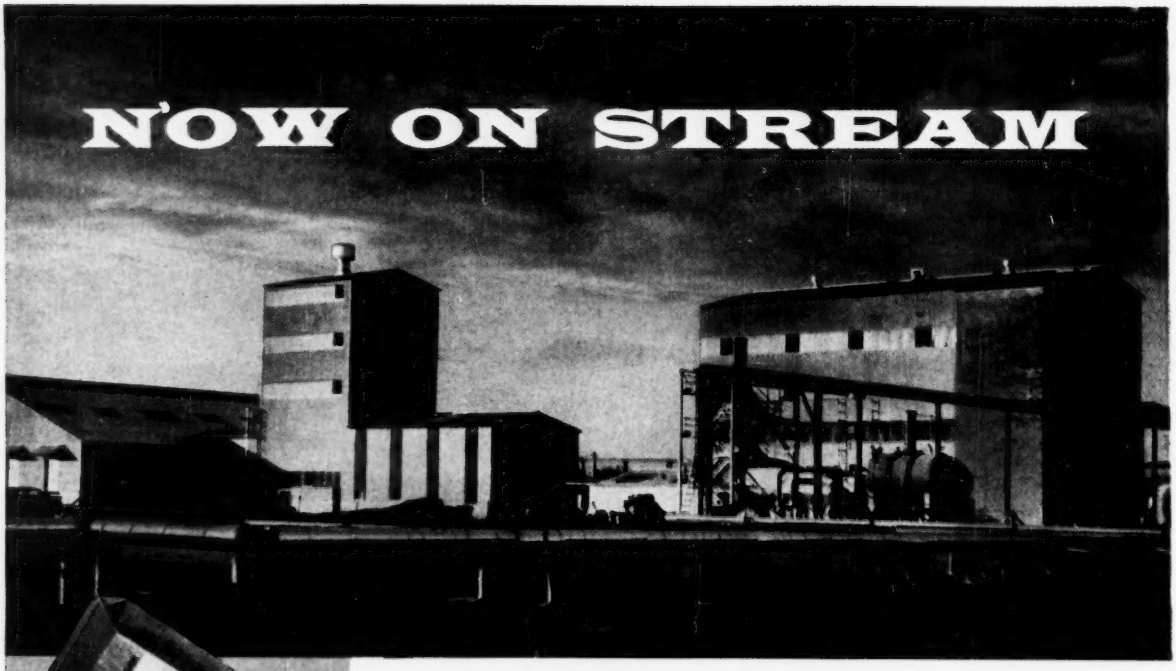

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ESCAMBIA PVC 1225	intermediate molecular weight, particularly adapted for supported and unsupported sheeting.
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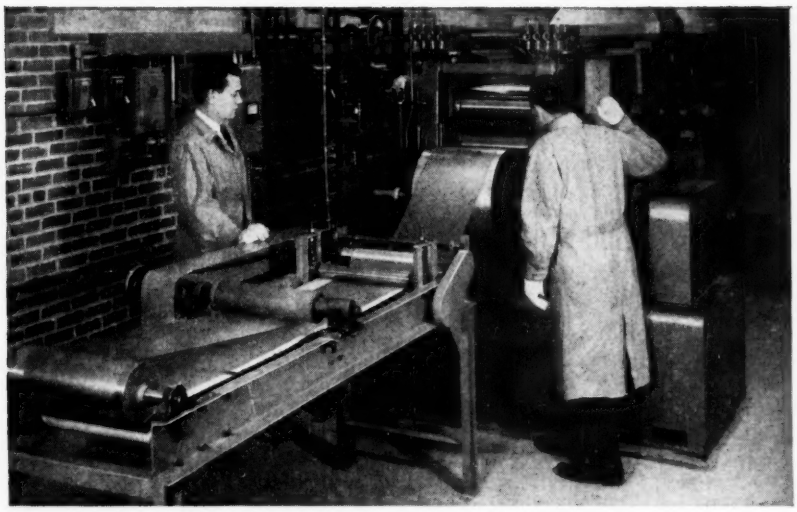
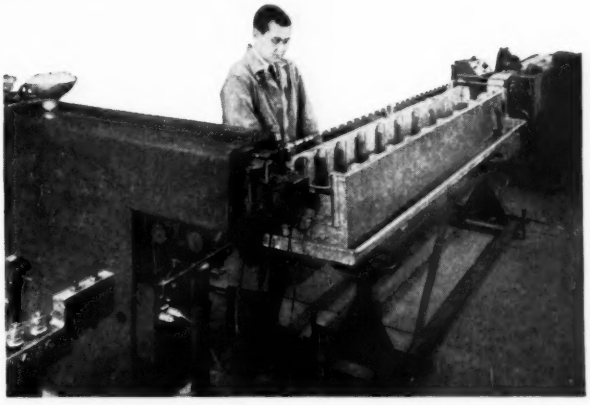
following these—Escambia will produce additional PVC resins for other specific purposes, including types for rigid and electrical applications.

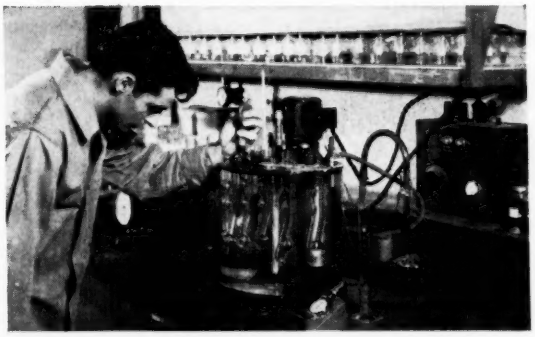


Calendering and extrusion operations

Technical Service

ESCAMBIA PROVIDES a well-staffed, fully-equipped customer and technical service laboratory ready to aid you in producing better products in your plant.





Viscosity measurements

Quality Control

is maintained by constant technical supervision of all production to assure highest quality and uniformity of Escambia products.

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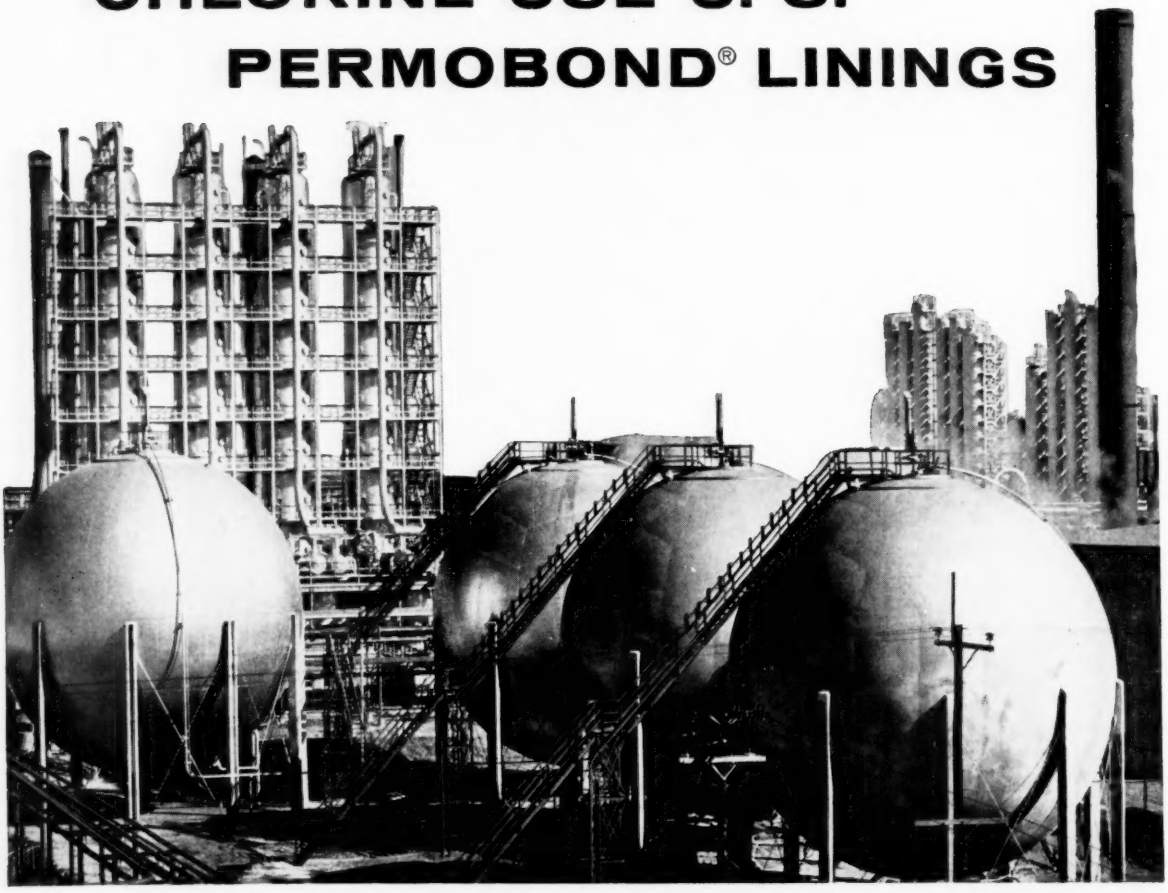

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United States Rubber

Technology
Newsletter

CHEMICAL WEEK
February 9, 1957

Jones & Laughlin, which has been considering a fluid-bed iron ore reduction mill for Baytown, Tex., has not yet decided to go ahead with the project—contrary to a widely held belief in the Southwest.

It has been looking at several processes, expects to decide by June 30 whether or not a fluid-bed installation merits further consideration.

J & L has also been considering making its own hydrogen—from natural gas, oil or similar material.

•

The world's largest nuclear power station is scheduled for 1962 completion—in West Kilbride, Scotland. Target date was revealed by a spokesman for the South of Scotland Electricity Board at a public hearing to register objections to the proposed station.

The power project would cost approximately $103.6 million, would supply approximately 25% of the electricity needed in the South of Scotland. It would bring in revenues of $11.2 million/year.

So far, there have been 33 objectors, chiefly residents of the area. But the National Farmers Union and the Scottish Landowners Federation have lodged complaints, too.

•

Similar objections to a proposed nuclear research station at Winfrith Heath in Dorsetshire (England) was to no avail this week, however. After four days of public hearings, the Minister of Housing and Local Government overruled objections that the labs would mar the remote, beautiful and unspoiled countryside, aggravate housing and school problems and upset the rural economy. But an objection that a radioactive effluent from the plant might damage the fisheries will receive further examination.

•

Du Pont will offer experimental and pilot-plant quantities of glycidal methacrylate (GMA)—a compound being groomed for jobs such as epoxidation of vinyl polymers, introduction of vinyl groups into condensation polymers.

GMA may be polymerized (or copolymerized) through the double bond and further reacted through the epoxide. Or the oxirane group may take part in polymerization, leaving the vinyl group open for cross-linking.

A light-colored, almost-odorless liquid, GMA will go for the developmental price of $5/lb. But Du Pont foresees possible price reductions if the chemical ever attains commercial stature.

Technology
Newsletter

(Continued)

A new process that increases the strength of magnesium alloy extrusions by as much as 40% is the culmination of nine years of development by Dow. How it works: magnesium is extruded from 0.016-in. spherical pellets, rather than solid billets normally used; blown into the extrusion chamber, the pellets are bonded into structural shapes by the friction, temperature and pressure of the extrusion.

The pellets are made by pouring a molten alloy of magnesium, zinc and zirconium onto a spinning disc. Developed for the Air Research and Development Command, the process is now in production.

•

The U. S. Dept. of Agriculture thinks it may be on the track of the right insecticides to combat cattle grubs. Dow's ET-57, a phosphate (O,O-dimethyl O-2,4,5 trichlorophenyl phosphorothioate) is given to cattle orally, has been termed "most promising of these finds" by USDA. Another phosphate, Bayer 21/199 is administered by spraying, has also done well in more limited tests.

USDA feels that a chemical that can be sprayed would be easier to use—especially on range cattle—than one that must be administered orally.

Grubs are the larvae of heel flies that enter cattles' bodies through the heel, and burrow through the flesh. They cost the U. S. livestock industry some $100-$200 million/year through damage to hides and flesh.

Though USDA is optimistic about the prospects of eliminating this loss, it cautions that neither insecticide is available commercially and that neither is yet recommended for grub control.

•

Hercules, in its just-out annual report, mentions the work it's doing on polypropylene. This is Hercules' first admission and one of the few statements by any U. S. company about work on the polymer.

•

The English are giving thought to bacterial reduction of sulfates to yield hydrogen sulfide for the production of sulfur or sulfuric acid. The bacteria would come from sewage sludge.

London's city council is now operating a small unit at its sewage works at Beckton, and engineers are considering plans for a pilot operation. If all the sludge in Britain were utilized, this could produce 100,000 tons of sulfur annually.

•

Lederle is making available a new form of tetracycline (Achromycin V). It incorporates sodium metaphosphate, which, Lederle says, enhances systemic absorption of the antibiotic.

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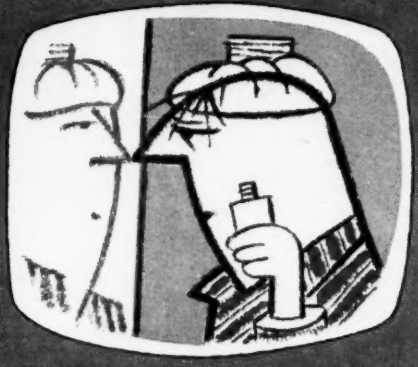
puts you in the starring role

*(This TV stands for the Tremendous Versatility of Pfizer Chemicals)

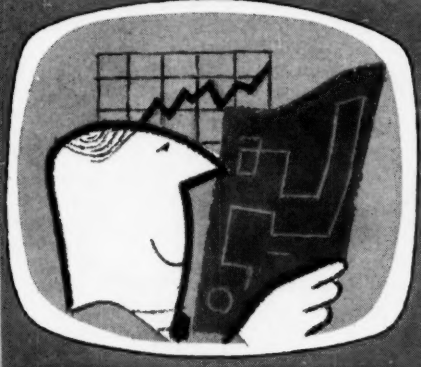
This is a story about you and the role Pfizer chemicals can play in your daily life. (Just a few examples). *Fanfare... lights... camera...*



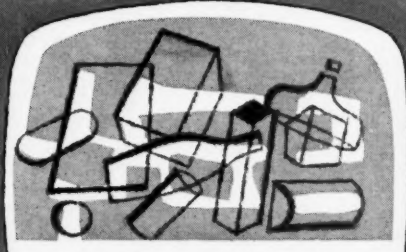
MORNING SCENE:...You, contemplating yourself in bathroom mirror. Headachey? Cold coming on? You reach for tablets made with Pfizer Acetophenetidin (for pain relief) and Pfizer Caffeine, always of highest purity... Next...

BREAKFAST SCENE: Biscuits? Vitamin-enriched with Pfizer Bi-Cap. Jelly? Pfizer Citric Acid brings out true fruit flavor. Frozen peaches on cereal? Better color and flavor, thanks to Pfizer Ascorbic Acid. Even the... oops! We're lagging...

"OFF-TO-WORK" SCENE: You're rushing out now, into shiny car. Shiny? Sure! Pfizer acids (e.g. Citric and Tartaric) offer a wide application in metal cleaning, polishing and plating. Now we "dissolve" (as they say in TV) to...



OFFICE SCENE: You're studying blueprints... far easier to read... Pfizer Oxalates give blueprint papers special vivid blue color. We could go on with many more examples. Our point is... well, here's a brief "commercial"...



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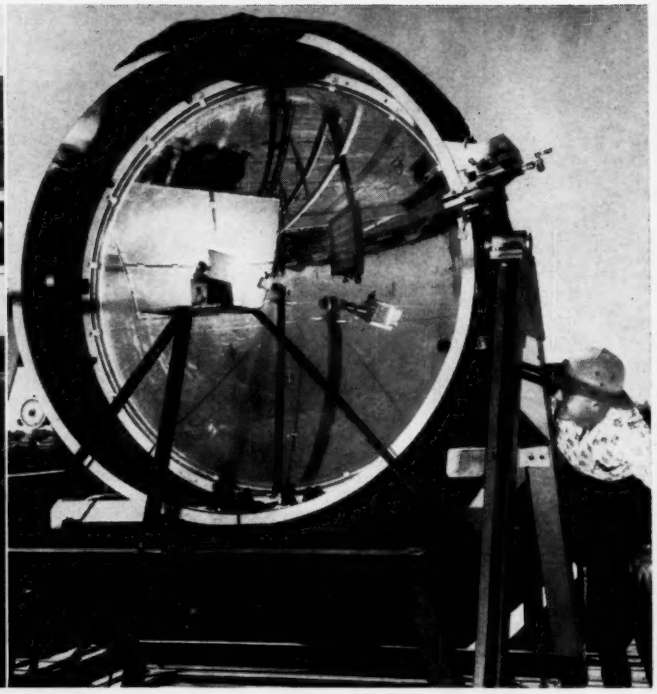


NEW UNDER THE SUN: Arthur D. Little's entry (left, with codesigner Peter Glaser); Univ. of Arizona's furnace.

Solar Furnace Moves Indoors

Hard on the heels of the recent Arizona solar-furnace symposium* comes word this week of a new development that improves the outlook for such furnaces in chemical research. Arthur D. Little (Cambridge, Mass.) reports that a high-intensity electric arc can substitute for the sun, permit "solar" furnaces to be used indoors.

Freed of dependence on weather vagaries, researchers can use the apparatus full-time for the job it does best —creation of high temperatures uncomplicated by contamination, magnetic fields and other by-products of traditional heat sources.

For its tests, ADL is using its new "shelf item" solar furnace (*above, left*), built around a U.S. Army searchlight, that sells for $14,500 installed. As designed by ADL's Peter Glaser, in cooperation with Tibor Laszlo of Fordham University, the furnace under sunlight provides temperatures up to 3,500 C over a circular area of 0.6 sq. cm. Further experiments by Glaser and Laszlo show that their furnace can be even more versatile than originally expected.

Drawing its heat from the arc (the electrode materials of which are secret) ADL's furnace will reportedly develop temperatures as high as 6,000 C with a heat flux of about 400 cal./sq. cm./second (about that obtained with sunlight). Research can be carried on indoors—regardless of inclement weather, darkness, etc.

Because the furnace does not have to track the sun, the container or sample being heated doesn't tilt—an asset in tests involving low-surface-tension liquids. And the furnace can be attached to an instrument, such as a mass spectrometer, that is impractical to use outdoors.

ADL hasn't come up with firm figures on what the indoor furnace will cost to install or operate. It's guessing that complete installation will cost $30,000. Power for the arc can be supplied by a 20-kw. generator, using about 20 gal. of gasoline daily.

Glaser explains that direct use of the arc for heating samples isn't practical because the arc is enshrouded with a magnetic field and chemically active atmosphere. That poses the problem of finding a suitable container to hold samples under study. The "solar" furnace uses only the radiant energy of the arc, enables precise studies of such phenomena as the electrical conductivity of single molten salts, chemical reactions in fused salts, solution of gases in molten metals, etc. What's more, the heat can be applied and withdrawn quickly.

ADL expects no immediate profits from its new furnace, even though the searchlight (before conversion) costs only $600-700. The furnaces are too expensive to build. But the firm does hope the furnace will be used to widen the horizons of high-temperature research and ultimately lead to new research contracts in this field.

*Held in Phoenix and Tempe on Jan. 20-22, the meeting drew 200 solar energy researchers and enthusiasts. It was sponsored by the Assn. for Applied Solar Energy, cosponsored by Arizona State College at Tempe, Stanford Research Institute and University of Arizona.

PECJAK, SUN AND NEUTRON PHOTO*: In neutron diffraction patterns, a potentially profitable guide to new crystal uses.

Neutron Crystal Gazers

Crystal-structure researchers are this week examining a sparkling new facet of neutron diffraction pioneered at Westinghouse's materials engineering department (Pittsburgh).

The work of K. H. Sun and Frances Pecjak (in cooperation with W. O. Wollan, Oak Ridge National Laboratory), the find makes neutrons more "visible" to photographic film, drastically cuts exposure time previously required (*CW, Technology Newsletter, Jan. 26*).

Like X rays, neutrons are diffracted or "scattered" by atoms in passing through a crystal. But—unlike X-ray pictures—neutron exposures may take hours to give a satisfactory picture. That's because standard photographic film is relatively "blind" to neutrons.

By the Westinghouse technique, neutron energy is converted into visible light—to which the film is sensitive. After being "scattered" by a crystal, the neutrons strike a special fluorescent screen placed next to the film. The screen consists of a phosphor imbedded in a thin layer of glass or plastic containing boron. Neutrons pass through the photographic film, strike the boron atoms, release flashes of light that picture the diffracted neutrons.

Neutron diffraction is expected to expose the structure of crystals of magnetic materials (which cannot be done by X rays), similarly help in more precise analysis of organic materials (whose hydrogen atoms do not scatter X rays well enough to permit their identification in a crystal structure).

Because the neutrons are themselves tiny magnets, they interact with the atoms of a bombarded magnetic material, disclosing its structure.

So far, Sun and his associates have experimented only with nickel—the neutron diffraction pattern of which is shown above. But they expect to look into organics, too.

* Pattern yielded by nickel.

Bantam-Weight Power Package

A miniature nuclear battery was unveiled last week by Walter Kidde Nuclear Laboratories, Inc. (Garden City, L.I., N.Y.) and Elgin National Watch Co. (Elgin, Ill.). A joint development of the two firms, the battery won't be commercially available for about three years. But it milestones a promising use of radioactive materials.

Unlike relatively short-lived chemical batteries (whose useful life depends on energy withdrawal), the newcomer reportedly will last about five years regardless of how much use is made of it.

The battery's fuel is the radioisotope, promethium-147. Mixed with a cadmium sulfide phosphor, promethium-147 oxide emits β-particles, which are absorbed by the phosphor and converted into infrared radiation. Soaked up by a silicon photocell, this radiation is transformed into electrical energy.

The Elgin-Kidde prototype battery uses about 4½ curies of promethium-147 (5 mg. of Pm_2O_3), has a nominal power output of 20 microwatts when new, 10 microwatts after 2½ years and 5 microwatts after about 5 years. Greater power outputs can be obtained by connecting a number of cells in series or by building cells of larger area.

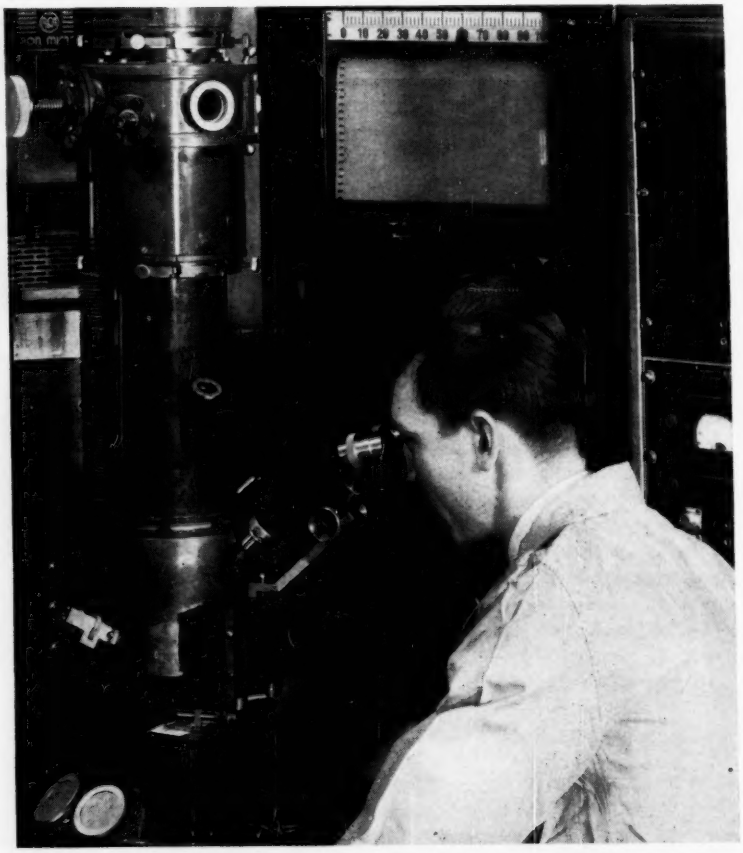
For extended personal use (as in

ATOMIC MITE: For chemical batteries, a bantam-size threat.

wrist watches), the cell can be sealed in a small case of dense metal such as tantalum. That reportedly keeps the wearer safe from the battery's radiation.

Robert Miller, Elgin's manager of physical research, predicts the battery will be used in wrist watches, expects it to find its way into hearing aids, portable radios, etc. Philip Miller, Kidde's laboratory director, points out that present high cost and scarcity of promethium-147 are holding back marketing of the new battery.

But the element is fast passing out of the scarce category. A new pilot plant for making it is now under construction at Oak Ridge National Laboratory (Oak Ridge, Tenn.). The Atomic Energy Commission believes promethium-147 should be available (in large quantities) at 50¢/curie.



New Analyzer Probes a Point

The U.S. Steel researcher above is investigating an area a few microns wide. Called point-probe analysis, it's a French development being refined at U.S. Steel's research lab (Monroeville, Pa.). Potential value: in studying intragranular corrosion, metallic grain boundaries, etc. The method uses an electron gun that accelerates electrons through approximately 30,000 volts; they bombard the specimen, causing it to emit X rays.

The X rays are reflected from a lithium fluoride crystal and their wave length is measured. This, in turn, provides a measure of the quantity of element present in the specimen. So far, the technique has proved capable of detecting all elements with atomic numbers of 22 (titanium) or higher.

Behind Koppers successful solutions to every type of industrial air pollution problem lies three-quarters of a century of research and development in this country and abroad. From all this "know-how" come the basic types of gas cleaning units, produced by Koppers, that can solve any gas cleaning problem you may have.

KOPPERS 75 Years' Experience can Solve Your Industrial Gas Cleaning Problem!

ONE REASON WHY KOPPERS can make this promise is that Koppers builds the basic types of gas cleaning units. But obviously, that's not enough!

It takes wide knowledge and experience to put the right equipment to work for you.

How Koppers got that knowledge and experience is a story in itself. By building gas handling equipment for over seventy-five years. By handling coke gases in Koppers own plants for over forty-five years. By successfully solving gas cleaning problems in every industry where they are a headache . . . in plants of all sizes, with a wide variety of individual problems. So . . . when a Koppers engineer studies your specific problem, you know he has this wealth of experience to draw upon. It helps make him the best gas cleaning engineer in the business.

To drive your costs down even further in the solution of gas cleaning problems, Koppers carries on a never-ending research program . . . creating new gas cleaning techniques . . . finding out more and more about the properties and composition of materials that pollute the air. That's the job of Koppers' multi-million dollar research center at Verona, Pa.

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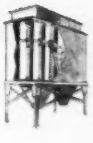
INDUSTRIAL GAS CLEANING EQUIPMENT

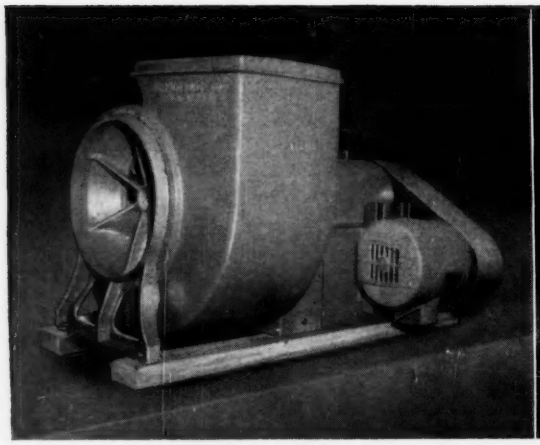
Whatever You Need, Koppers Makes It.

Koppers Electrostatic Precipitator. Koppers custom-designs Electrostatic Precipitators that eliminate "stack nuisance" . . . remove fly ash, acid mist, soot . . . recover high-value material.

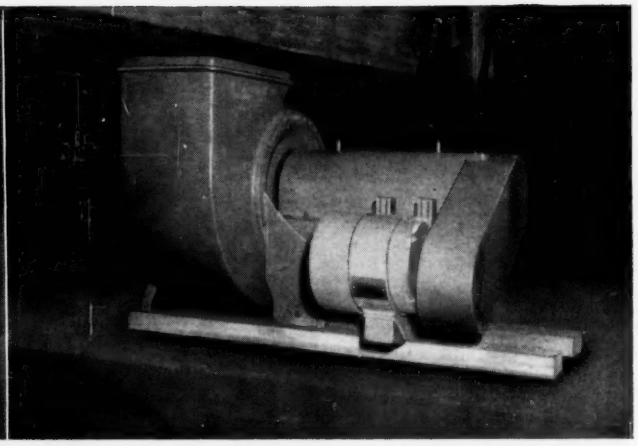
Koppers New Cyclonic Type Dust Collectors. Produced after intensive study and experience, Koppers Mechanical Dust Collector provides maximum efficiency in mechanical dust removal.



Koppers Aeroturn Dust Collectors. Automatic pressure control and reverse-air-jet action provide high, continuous filtering. Clean air, reclaimed materials. Felt-type filters are more efficient; last longer.



Inlet side showing cast iron inlet cone with integrally cast guide vanes. Fan is an Arrangement 9 package unit with monel wheel.



Drive side showing enclosed motor, belt guard and rain shield over ball bearings and shaft drive.

"BUFFALO" HIGH-EFFICIENCY CAST IRON FANS ARE SAVING MONEY ON CORROSIVE FUME INSTALLATIONS

Developed by "Buffalo" engineers to meet a specific request for high efficiency fans to operate under extremely corrosive condition, these fans combine cast iron durability with the well-known high performance of "Buffalo" Limit-Load® Fans. These No. 2½ Type "LL" Fans are popular with the chemical and process industries; one large manufacturer having over 1,000 units installed on chemical fume hood exhaust.

Rugged cast iron housings and cast inlet cones with integrally cast inlet vanes, guide air smoothly into the wheels, for the low-turbulence air flow inherent in this high efficiency design.

As with all "Buffalo" Fans, these have the famous "Q" Factor — the built-in Quality which provides trouble-free satisfaction and long life.

These fans have the backward curved blade wheel, non-overloading, regardless of system pressure. Standard wheels are monel but can be supplied in stainless or protective coated steel or of Everdur or aluminum for explosive atmospheres.

Three arrangements are available: with direct motor drive, separate belt drive or as a package unit with adjustable pitch V-belt drive and motor mounted on adjustable base rails.

Your inquiries on these rugged chemical-industry fans are invited. Write today on your company letterhead.

Roof exhaust installation at a major chemical and dye plant.

"Buffalo"

BUFFALO FORGE COMPANY

BUFFALO, NEW YORK

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

VENTILATING AIR CLEANING AIR TEMPERING INDUCED DRAFT EXHAUSTING FORCED DRAFT COOLING HEATING PRESSURE BLOWING

Market Newsletter

CHEMICAL WEEK
February 9, 1957

Nearly all major U.S. copper producers have shaved 2¢/lb. off the metal's price. Initiated by Phelps-Dodge late last week, the move was tabbed by most trade observers as "the fulfillment of a prediction" sparked by the market-churning of the past several days. Custom smelters' tags, for instance, slipped twice last week, settled at the 34¢/lb. level. This left producers' quotes 2¢/lb. above the smelter price and a good 4¢/lb. higher than the London market.

With copper calls at a low pitch (especially from automotive-slackened demands for brass), and many consumers sitting on their order blanks—anticipating further drops in the metal's price—domestic makers' schedules had nowhere to go but down.

One point frequently overlooked in copper market evaluations is this: while general demand has eased some within the past year, greater availability is—and has been—the strongest factor in pressuring copper prices down to more "realistic" ranges.

The price softening will affect copper chemical schedules. Already Phelps-Dodge has knocked 50¢/cwt. off its regular grade of copper sulfate, and $1/cwt. off its basic copper grade. Other sellers are expected to follow suit almost immediately.

Copper cyanide was cut a few weeks ago (a delayed reaction to the earlier metal reduction), but likely to be reduced now are the oxychloride, carbonates and hydrates. So, at any rate, say trade followers.

•

Is a general price rise due on superphosphate, other phosphatic fertilizers? More than likely, and probably this week. Portending the increase: recently hiked fuel oil prices that will nudge costs of phosphate rock production from which superphosphate is made.

Further underscoring the higher price probability: at least one major producer and distributor has advanced triple superphosphate (3¢/unit of available phosphoric acid) in the Philadelphia area. New bulk price (46% material, c.l.): $1.23/unit. Reason? Higher freight rates and labor costs.

•

If carbon black trade talk is accurate, consumers of some grades of channel black will soon be paying more for their needs. The anticipated increases—probably 1-1½¢/lb.—may be posted next week.

Carbon black shipments, incidentally, have been dropping somewhat, according to latest available figures. In the first 11 months of '56, shipments totaled less than 1.6 million lbs., compared with the corresponding '55 period's close to 1.7 million. Stocks on hand at the end of Nov. '56 were 339,896,000 lbs., nearly 122 million more than the Nov. '55 inventory.

There's no such oversupply problem in benzol; just about all available material is moving promptly to customers. This despite the fact that coke-oven operations continue at near-capacity rates, more petroleum-derived material is hitting the market, and benzol imports are still heavy. (Two major shipments this month, for example, one from Poland, one from Russia, totalled a shade under 2 million gal.)

But, as was indicated earlier (*CW, Dec. 1, '56, p. 100*), the foreign influx hasn't generated much resentment among U. S. producers. Rather, there's some concern in the trade that should imports suddenly be cut off, consumers would be in a tough spot. Why? Further coal-derived benzol output boosts will likely be nominal, and petro-benzene makers' expansions—slated to up U. S. capacity some 60-70 million gal./year—won't all be in for a good many months.

•

More di-isobutylene is hitting the market, and the expanding producer (Texas Co.) is also providing for additional production growth to meet increasing requirements of plastics, elastomers, lube oil additives, other outlets. Initial capacity of the just-in facilities at Port Arthur, Tex., will be some 8 million lbs./year.

Completion of the di-isobutylene installation, says Texas, "is another step in the company's current petrochemicals expansion which includes construction of a lubricating oil additive plant at Port Arthur and an ammonia plant at Lockport, Ill. (*CW, Jan. 12, p. 64*).

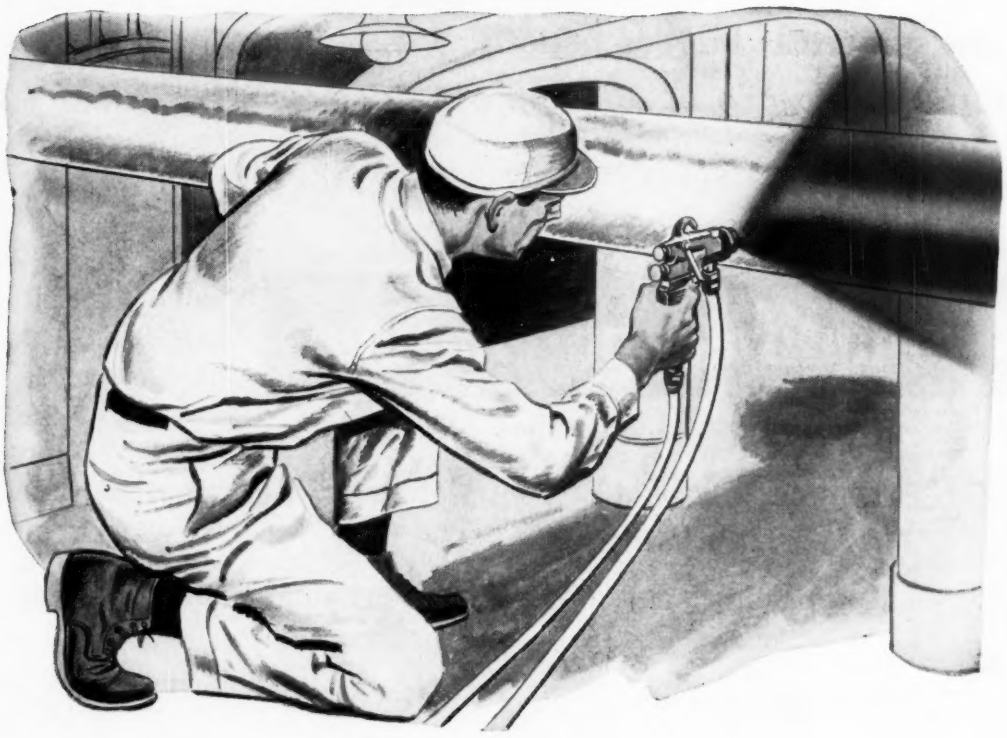
From Texas, too, there is promise of more neopentyl glycol—and at an appreciably lower price than the current 45¢/lb. The material will be available sometime next month in truckload and drum quantities from Texas Eastman's new plant at Longview.

The new glycol, which was introduced in pilot-plant amounts 14 months ago, has developed quite rapidly, says William Gearhart, Eastman's chemical sales development manager, "particularly in polyester resins and plasticizers." Word of the anticipated price reduction also comes from Gearhart.

SELECTED PRICE CHANGES—Week Ending Feb. 4, 1957

	Change	New Price
UP		
Stannic oxide, dms., dlvd., E.	$0.02	$1.085
Toxaphene, dms., c.l., t.l., wks.	0.01	0.22
Vinyl n-butly ether, tech., dms., l.c.l., wks.	0.05	0.35
DOWN		
Cobalt, metal, 97-99%, kgs., ex wrse.	$0.35	$2.00
Cobalt oxide, black, 72.5-73.5%, Co., kgs.	0.26	1.52
Copper, metal, eletrolytic, dlvd., Valley basis	0.02	0.34
Copper sulfate, CP, gran., dms., wks.	0.005	0.203

All prices per pound unless quantity is stated.



wash primers improve performance of cold coatings

On metal surfaces exposed to a corrosive atmosphere, wash primers improve the performance of cold coatings based on coal tar systems. Such primers made with Shawinigan Resins' FORMVAR, polyvinyl formal, or BUTVAR, polyvinyl butyral, not only provide excellent corrosion resistance . . . they also provide superior anchorage for the cold coating.

The use of a wash primer based on polyvinyl butyral is strongly recommended when metal pipe or metal structures are coated under conditions of high humidity, high atmospheric temperature and condensation. Anti-corrosive wash primers have a long history of success under such conditions. Only a 0.3 to 0.8 mil thick film is required to provide a tough, protective coating. Wash primers apply easier, adhere better, and dry faster than conventional materials. Formulation of a primer with FORMVAR or BUTVAR is easy in your regular ball or pebble mill.

Wash primers have extended the life of metals in many applications and have opened profitable new markets for paint manufacturers. For full technical information and suggested formulations, write Shawinigan Resins Corporation, Department 1106, Springfield 1, Massachusetts.

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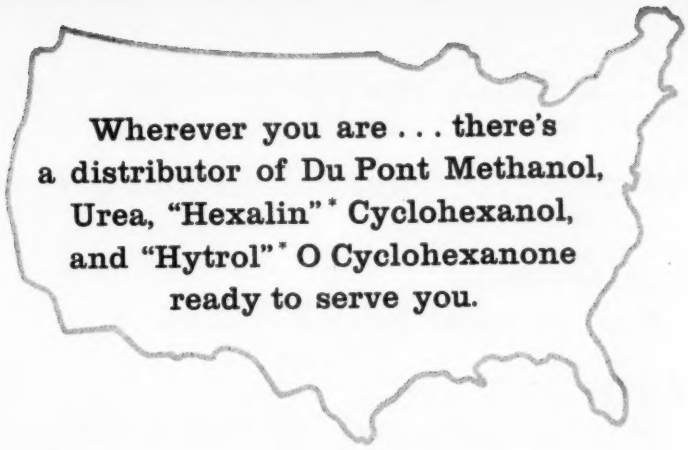

Savings of time and money, through simplified purchasing, are only two of the benefits from dealing with your Du Pont Distributor of Methanol and Urea. Another reason is fast service . . . personal service. Each distributor has the *equipment*, the *manpower* and the inventory needed to serve you quickly and efficiently.

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FOR METHANOL

CALIFORNIA
Los Angeles — Braun Corporation
San Francisco — Braun-Knecht-Heimann Co.

COLORADO
Denver — The Chemical Sales Co.

FLORIDA
Jacksonville — Apperson Chemical, Inc.
Miami — Biscayne Chemical Labs, Inc.
Orlando — Lenfestey Supply Company
Tampa — Lenfestey Supply Company

GEORGIA
Atlanta — Chemical Services, Inc.

ILLINOIS
Chicago — Central Solvents & Chemicals Co.
Chicago — Phillips & Martin Co.

INDIANA
Ft. Wayne — Hoosier Solvents & Chemicals Corp.
Indianapolis — Hoosier Solvents & Chemicals Corp.

KANSAS
Wichita — Barada & Page, Inc.

KENTUCKY
Louisville — Dixie Solvents & Chemicals Co.

LOUISIANA
New Orleans — Southern Solvents & Chemicals Corp.

MARYLAND
Baltimore — Leidy Chemicals Corp.

MASSACHUSETTS
Boston — Howe & French, Inc.

MICHIGAN
Detroit — Western Solvents & Chemicals Co.
Grand Rapids — Wolverine Solvents & Chemicals Co.

MINNESOTA
St. Paul — Lyon Chemicals, Inc.

MISSOURI
Kansas City — Barada & Page, Inc.
Kansas City — Missouri Solvents & Chemicals Co.
St. Louis — Missouri Solvents & Chemicals Co.

NEW JERSEY
Lyndhurst — Stoney-Mueller, Inc.

NEW YORK
Binghamton — Collier Chemicals, Inc.
Buffalo — Chemical Sales Corp.
Rensselaer — Eastern Chemicals, Inc.
Rochester — Chemical Sales Corp.

NORTH CAROLINA
Durham — Cardinal Products, Inc.

OHIO
Cincinnati — Amsco Solvents & Chemicals Co.
Cleveland — Ohio Solvents & Chemicals Co.
Toledo — Toledo Solvents & Chemicals Co.

OKLAHOMA
Tulsa — Ward & Kimball Chemical Co.

OREGON
Portland — Van Waters & Rogers, Inc.

PENNSYLVANIA
Pittsburgh — Vitro Manufacturing Co.

TENNESSEE
Memphis — Chapman Chemical Co.

TEXAS
Dallas — Texas Solvents & Chemicals Co.
Dallas — Van Waters & Rogers, Inc.
Houston — Texas Solvents & Chemicals Co.

UTAH
Salt Lake City — Braun-Knecht-Heimann Co.
Salt Lake City — Wasatch Chemical Co.

WASHINGTON
Seattle — Van Waters & Rogers, Inc.
Spokane — Van Waters & Rogers, Inc.

WISCONSIN
Milwaukee — Wisconsin Solvents & Chemicals Corp.

FOR UREA

ALABAMA
Birmingham — F. H. Ross & Co.
Mobile — F. H. Ross & Co.

CALIFORNIA
Los Angeles — Braun Corporation
San Francisco — Braun-Knecht-Heimann Co.

CONNECTICUT
South Norwalk — Merchants Chemical Co., Inc.

FLORIDA
Jacksonville — F. H. Ross & Co.

GEORGIA
Atlanta — F. H. Ross & Co.
Columbus — F. H. Ross & Co.
Savannah — F. H. Ross & Co.

ILLINOIS
Chicago — Central Solvents & Chemicals Co.

KENTUCKY
Louisville — Merchants Chemical Co., Inc.

MARYLAND
Baltimore — Leidy Chemicals Corp.

MASSACHUSETTS
Fall River — Borden & Remington Co.
Stoneham — George Mann & Co., Inc.
Worcester — Chemical Sales & Service Co., Inc.

MICHIGAN
Detroit — Eaton Chemical & Dyestuff Co.

MINNESOTA
Minneapolis — Merchants Chemical Co., Inc.

MISSISSIPPI
Jackson — F. H. Ross & Co.

MISSOURI
Kansas City — Barada & Page, Inc.
St. Louis — Barada & Page, Inc.
St. Louis — Missouri Solvents & Chemicals Co.

NEW JERSEY
Newark — National Oil & Supply Co.
Paterson — Brown Chemical Co., Inc.

NEW YORK
Buffalo — Chemical Sales Corp.
Hicksville, Long Island — National Oil & Supply Co.
New York — Merchants Chemical Co., Inc.

NORTH CAROLINA
Charlotte — F. H. Ross & Co.
Greensboro — F. H. Ross & Co.
Raleigh — F. H. Ross & Co.

OHIO
Cincinnati — Merchants Chemical Co., Inc.
Cleveland — Ohio Solvents & Chemicals Co.
Columbus — Merchants Chemical Co., Inc.

OREGON
Portland — Van Waters & Rogers, Inc.

PENNSYLVANIA
Altoona — Western Penna. Chemical Co., Inc.
Erie — Western Penna. Chemical Co., Inc.
Middletown (Harrisburg) — Western Penna. Chemical Co., Inc.
Philadelphia — Pioneer Salt Co.

RHODE ISLAND
Providence — Borden & Remington Co.
Providence — George Mann & Co., Inc.

SOUTH CAROLINA
Columbia — F. H. Ross & Co.
Greenville — F. H. Ross & Co.

TENNESSEE
Chattanooga — Burkart-Schier Chemical Co.
Knoxville — Burkart-Schier Chemical Co.
Knoxville — F. H. Ross & Co.
Nashville — Burkart-Schier Chemical Co.

TEXAS
Dallas — Van Waters & Rogers, Inc.
Houston — Van Waters & Rogers, Inc.

UTAH
Salt Lake City — Braun Knecht-Heimann Co.

WASHINGTON
Seattle — Van Waters & Rogers, Inc.

FOR "HEXALIN" & "HYTROL" O

CALIFORNIA
Los Angeles — Mefford Chemical Company

ILLINOIS
Chicago — Central Solvents & Chemicals Co.

INDIANA
Fort Wayne — Hoosier Solvents & Chemicals Corp.
Indianapolis — Hoosier Solvents & Chemicals Corp.

KENTUCKY
Louisville — Dixie Solvents & Chemicals Co.

MASSACHUSETTS
Boston — Howe & French, Inc.
Worcester — Chemical Sales & Service Co., Inc.

MICHIGAN
Detroit — Western Solvents & Chemicals Co.

MISSOURI
Kansas City — Missouri Solvents & Chemicals Co.
St. Louis — Missouri Solvents & Chemicals Co.

OHIO
Cincinnati — Amsco Solvents & Chemicals Co.
Cleveland — Ohio Solvents & Chemicals Co.
Toledo — Toledo Solvents & Chemicals Co.

TEXAS
Dallas — Texas Solvents & Chemicals Co.
Houston — Texas Solvents & Chemicals Co.

*Reg. U. S. Pat. Off.

What's Worrying Sales Managers

- **COMPETITION**
  It will get rougher before it eases up.
- **COSTS**
  After expected increases, there will be little room for cutting operating costs.
- **PROFITS**
  Mounting costs of coverage, technical service, other "extras" will further reduce margins.
- **SALESMEN**
  Manpower shortage will remain severe although a slight easing is likely. Profit-per-man also looms as top problem.
- **DISTRIBUTORS**
  Some unaggressive ones will continue to act as a drag on all-out selling by manufacturers.

Push to Meet Predictions

Chemical sales executives, striving to live up to their optimistic sales forecasts, are drawing a bead on some tough problems that loom during '57. Worst worries: razor-sharp competition, climbing costs, thinning profit margins and an ever-short supply of salesmen.

That's the picture *CW* sees in a just-completed survey of sales management.

Here, problem by problem, is what sales managers see ahead, and the actions they plan in order to turn forecast into reality.

Competition: There'll be no letup in the competitive scramble that has marked sales activity in recent years. If anything, say sales managers, it will be worse this year than last. Look for more "deals," more reciprocity, more demands for costly service.

Sales managers will meet the challenge head-on; deals will be countered by better deals, reciprocity by greater reciprocity. Both sales service and technical service will be stepped up. And there'll be major efforts to improve sales staff effectiveness by additional training.

Rising transportation costs will plague sales managers and traffic managers—and complicate the competitive picture. Some observers predict that recently hiked ocean and rail freight rates (and any further increases) will disturb long-established marketing patterns. Yet, others feel that the boosts should give them an opportunity to invade new areas.

Costs: Most sales managers expect marketing costs to rise, but there's wide disagreement on the magnitude. Many think that costs will be comparable to 1956 on a per-man basis, with no more than a slight increase. Others, however, predict a significant boost.

Too, many feel that management has gone about as far as it can wisely go at present in paring marketing expenses. Attention will turn to the myriad little things that gnaw at profits. And more companies will desert high-priced downtown office locations in favor of suburbs where space is available for combination office-warehouses. Several anticipate cost-chopping drives in production departments rather than in sales.

Profits: With limited opportunity available for cost-cutting, management this year will increasingly emphasize a need for higher volume. This effort will, of course, be aimed at getting a better utilization of fixed office expenses. Some companies in the Southwest will swing to air travel for salesmen, using rent-a-car arrangements at stop-off points to make additional selling time available.

Sales forces will be made more profit-conscious; the trend to place responsibility for profit further down the sales management line will grow markedly. Salesmen—besides product and district managers—will be held more accountable for their profit records.

And, don't be surprised if '57 becomes the year that many companies stop absorbing the expense of "deals" and service "extras." The attitude is growing that "now is the time to draw the line, adjust price structures to reflect the costs of increased service."

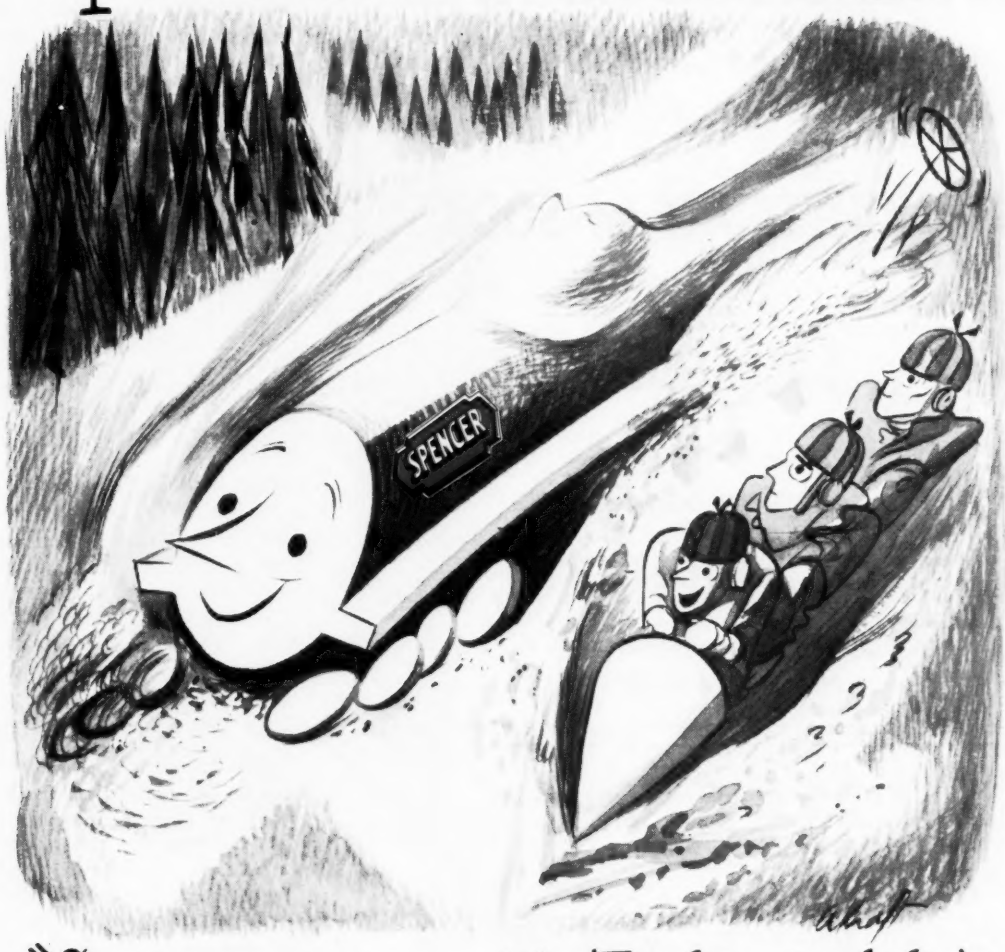
Salesmen: The scarcity of technically trained men available for sales will likely ease slightly this year. Large expansions of sales forces, much in evidence in '56 plans, are not as prominent this year; but nonetheless, the shortage will remain acute. Men with the more specialized technical backgrounds will be hardest to find.

To beat the shortage, increased use will be made of nontechnical men. Several companies have already adopted the idea, others will likely follow. On the recruitment front, chances are excellent that companies will increase starting salaries. And a few new gimmicks (e. g., subsidies for college students) may well make an appearance.

Naturally, efforts will continue to improve salesmen productivity through more comprehensive training in product and sales technique.

Group selling techniques—particu-

Spencer Service is Wonderful



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GENERAL OFFICES: Dwight Bldg., Kansas City 5, Mo. DISTRICT SALES OFFICES: 500 Fifth Avenue, New York City; First National Bank Bldg., Chicago, Ill.; Candler Bldg., Atlanta, Ga.; Union Planters National Bank Bldg., Memphis, Tenn.

larly symposiums to describe to potential customers new products in early stages of development—will be emphasized.

Distributors: Many companies plan no change in the extent of use of distributors or in distributor policies.

Yet, a common feeling exists that jobbers aren't contributing sufficiently to the sales effort. The answer: sharp scrutiny of the effectiveness of individual jobbers, elimination of weak outlets.

A few firms will intensify their promotion in supporting their distributors: some will tend to shift to the distributor products that they can't profitably sell in volume in certain areas. One concern, for example, will shunt all less-than-2,000-lb. orders to jobbers. Another will investigate the use of brokers.

All in All: Sales managers, by and large, anticipate rising sales curves during '57. But the push behind the rise will take nothing less than an all-out effort to keep the competition in check and the profits coming in.

Bag Bypass for Suez?

Great Britain is rushing work this week on an idea that holds promise of solving oil shortage problems stemming from the Suez crisis.

The idea: use of giant laminated nylon tubes, strong enough to float in all sea conditions and holding a 9,000-ton oil cargo. The tubes (30 ft. in diameter, 600 ft. long) could be towed by ships with only 25% of the horsepower necessary for tankers of the same capacity.

Impressed with theoretical calculations and wave-tank test results employing a glycerine-filled, 16-ft.-long, 9½-in.-diameter model, the National Physical Laboratory is now preparing for sea trials of a 3-ft.-diameter. 60-ft.-long unit.

Rigorous mathematical studies indicate that loads would not exceed 5 tons/in. along the container, even in rough, 50-ft. seas. Tube design will aim at balancing the buoyancy of water below the water line against the weight above; the contemplated 600-ft.-long sack would project only about 5 ft. above the surface.

The cylindrical shape chosen has low wave-making characteristics, offers the least drag for the most volume. Stresswise, say laboratory

what

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Big Spring, Texas

SALES

scientists, the tube is continuously tensed—but with a low-magnitude skin loading. Under the worst possible conditions (with one end high, the other low), a container with a half-inch-thick wall should be capable of withstanding the strain.

Plastic Use: The wall material is a laminated nylon fabric impregnated with polyester or styrene resin to impart strength characteristics of reinforced-rubber sheeting. When towed at a 15-knot speed, tube drag amounts to only 20 tons—low enough to allow towing by 2,000-hp. vessels. Interestingly, the towing load is negligible, compared with the hydro stresses. Nonetheless, the ultimate size may be governed more by handling problems than by structural or stress factors—a condition also common to large tankers.

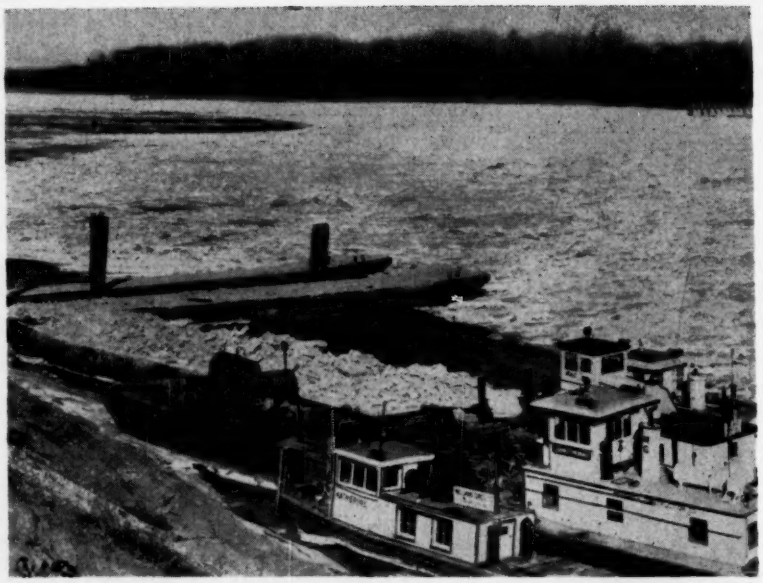
Hope exists that bulkheads won't have to be used in the tube's construction. But that depends on how much damage marine creatures (especially swordfish) might do if hostile to floating tubes. Currently, a zoologist's report is in preparation.

If the giant bags prove out, Europe's oil and petrochemical industry will not be dependent on the Suez Canal.

And, of course, there's a chance that some enterprising chemical company will investigate similar containers for shipping liquid chemicals.

DATA DIGEST

- **Rubber clays:** Bulletin gives analysis data and specifications of water-fractionated clays suitable for rubber compounding, proposes application where stock whiteness, extrusion speed, low water adsorption, or fast cures are desirable. Harwick Standard Chemical Co. (Akron, O.).
- **Polyurethane foam resin:** 6-p. folder presents acoustical, aging, chemical and fire resistance, setting, density storage, strength, thermal, toxicity and other properties of Nafil resin in production of polyurethane foams. Chase Chemical Corp. (Pittsburgh).
- **Synthetic paraffin:** 4-p. booklet outlines properties and potential applications of Paraflint (Fischer-Tropsch type wax) in polish formulations, rubber, plastic, protective coatings manufacture and other fields. Moore & Munger (New York).



SLOWDOWN: River ice delays barging, lowers Mississippi water level.

Ice on Troubled Waters

If the Mississippi River system is important in your distribution scheme, it will pay you to keep a close check on its condition for the rest of the winter.

Although the Supreme Court has just extended until Feb. 28 diversion of an extra 7,000 cu. ft./second of Great Lakes water to the famished barge channels, there's rising doubt about how much help will result. And the ruling will further fuel the raging controversy over the diversion of lake water.

The first extra diversion* was granted to remedy low water levels caused by prolonged drought and a normal winter drop. The boost resulted in a significant improvement in Mississippi navigation (*CW, Nov. 24, '56, p. 24*). But now, below-normal winter weather has spurred ice-gorge formation on the Missouri. By obstructing water flow into the Mississippi, the gorges have reduced the water level at the all-important Alton locks north of St. Louis.

Barring extensive gorge formation, the Army Corps of Engineers predicts that it can maintain a 7-ft. 9-in. level at the Alton sill with the diverted water. Normal channel: 9 ft. Ice conditions have indirectly (by dropping water level) increased lighterage operations at the Alton locks.

Ice, too, is slowing navigation on Mississippi, Missouri, Ohio and Columbia rivers. Complete relief to the low-water-level problem isn't expected till spring, when melting snows swell channel depths.

Fight Looming: By spring, the tussle between lake and river interests will be in full fury. Bills have already been introduced in Congress to authorize increase of the permanent diversion of 1,500 cu. ft./second to 2,500 cu. ft./second for a 3-year test period.

River barge operators and their associations will back the bills; and river cities and states argue that the prolonged 4-year drought has dropped river levels to a point where only diversion can help, and that the Great Lakes have sufficient water to spare. They'll point out, for example, that a 1-ft. loss in loading depth decreases capacity of an oil barge some 40,000 gal., results in slower service and increased operating costs.

The Lake Carriers Assn., several lake states and Canada are lining up against the diversion, will most likely oppose the Congressional bills. Here's why:

Over the years, the size of lake vessels has been steadily increasing. Lake carriers fear that the temporary diver-

* A diversion of 1,500 cu. ft./second is permanently authorized.

News from

National Carbon Company

A Division of Union Carbide and Carbon Corporation • 30 East 42nd Street, New York 17, N. Y.

Sales Offices: Atlanta, Chicago, Dallas, Kansas City, Los Angeles, New York, Pittsburgh, San Francisco. IN CANADA: Union Carbide Canada Limited, Toronto

PROCESS EQUIPMENT BRIEFS

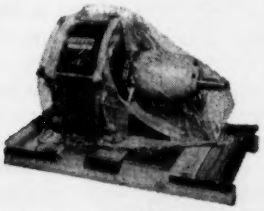
New heat exchanger sizes

A steady progression of unit capacities – in eight standard sizes having from 17.7 to 162.2 sq. ft. of heat transfer surface – is now available from stock in "Karbate" impervious graphite heat exchangers, "Series 90A" and "Series 310A". Units have interchangeable end assemblies with choice of 1, 2, 3, 4 or 5 pass arrangements.

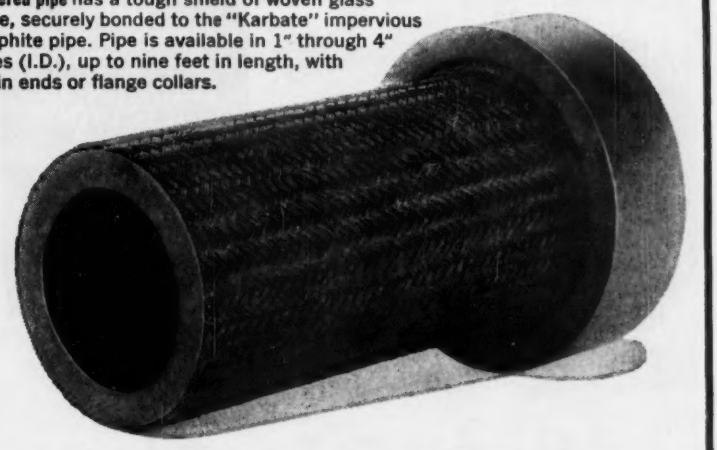
For details on these popular, low-cost corrosion-resistant units, request **Catalog Section No. S-6740.** Data on larger "Karbate" impervious graphite shell and tube heat exchangers (up to 3,585 sq. ft.) are given by **Catalog Section No. S-6800.**

Carload shipment of "Karbate" pumps

Increasing use of "Karbate" impervious graphite for transfer and circulating services is demonstrated by shipment of a carload of "Karbate" centrifugal pumps for use in rayon spin bath service. Here, where 15% H_2SO_4 at 200°F. is handled, the use of "Karbate" pumps will eliminate possibility of metallic contamination.



Packaging of "Karbate" pumps is convenient, too. Covered with vinyl film, each pump is securely anchored on a pallet and crated. Complete instructions on installation and operation are sent with each pump. For further information, ask for **Catalog Section No. S-7250.**



Armored pipe has a tough shield of woven glass fibre, securely bonded to the "Karbate" impervious graphite pipe. Pipe is available in 1" through 4" sizes (I.D.), up to nine feet in length, with plain ends or flange collars.

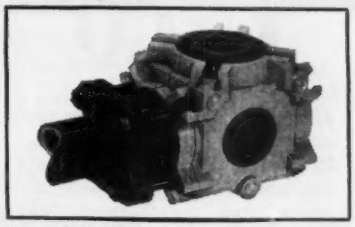
New "KARBATE" Armored Piping Gives Extra Safety with Corrosives

Greatly increased resistance to mechanical shock and strain is now a property of "Karbate" impervious graphite pipe and fittings. The reason: a newly-developed external armoring of tough, woven glass-fibre securely bonded to the pipe itself.

The most important result of this new idea in corrosion-resistant piping is the increased safety it provides in the handling of hot or corrosive liquids. In addition to increasing the resistance of "Karbate" pipe to accidental breakage, the closely-woven glass-fabric armoring remains intact even if the pipe should happen to be broken, holding line pressure . . . preventing potentially dangerous gross leakage.

Of course, this new line of "Karbate" armored pipe and fittings exhibits all the properties that have earned "Karbate" impervious graphite products wide acceptance in the chemical process industries: outstanding corrosion resistance . . . freedom from metallic contamination . . . resistance to thermal shock . . . ease of fabrication and installation.

For dimensions and other data on "Karbate" armored pipe and fittings, request **Catalog Section No S-7005.** Technical advice and assistance are also readily available.



Armored fittings have cast iron housing which not only armors the impervious graphite body but isolates it from any tensile or flexural stresses resulting from misalignment, vibration or expansion and contraction. Joint between pipe and flange collar has high strength because glass fibre sheath extends well into collar counterbore.

Adsorption a basic step in processing

Accumulated experience reveals that adsorption is a basic unit operation in chemical engineering technology. Its familiar applications include gas purification, air conditioning, solvent recovery and many other specialized uses.

Because of its enormous surface area, high porosity, low metal content and chemical inertness, the adsorbing agent is useful as a carrier for metal or metal salt catalysts and as a catalyst itself.

For a new booklet **(Catalog Section S-6450)** on the use of "Columbia" activated carbon in these applications, write National Carbon Company, 1300 Lakeside Ave., Cleveland 14, O.

NATIONAL TRADE-MARK

sion will set a precedent and become a permanent fixture. The city of Chicago has long been fighting for a boost in the present 1,500-cu.-ft./second rate.

The temporary 8,500-cu-ft. rate, say lake carriers, will satisfy only Chicago and the rest of Illinois for only a few years.

If the 8,500-cu.-ft. outflow becomes more or less permanent, lake shippers claim, levels in lakes and channels will drop 2 to 6 in., a loss in cargo carrying capacity of 3 to 10 million tons per shipping season.

(That point, however, is disputed by river carriers and others supporting diversion. They claim the lakes would drop a fraction of an inch, not seriously affecting lake cargo carrying capacity.)

Canadian opposition stems not only from navigation factors but also from electrical power considerations. Canada is ready with data to show that if the extra 7,000-cu.-ft./second diversion becomes permanent, the Niagara River utility plants alone would lose 443 million kilowatts of power over a 3-year period.

Currently, negotiations with the U. S. are about to get under way. Canada's attitude, reliable sources tell *CW*, is flexible; Canadian authorities will attempt to aid the U.S. in a temporary emergency when lake water-levels permit.

But a permanent diversion of a large enough quantity to hurt shipping and power companies is another matter, and staunch Canadian opposition can be expected. The Dominion can oppose diversion by the usual diplomatic representations or by action under the Boundary Waters Treaty of 1909 that allows Canada to seek indemnification in U.S. courts.

Canadian opposition was behind Presidential veto of two diversion bills similar to those now in the hopper. But if the bills pass, the situation, now more acute, will raise pressure on Eisenhower for approval.

Will chemical companies take a stand? Probably not. Most will prefer to stay out of the fast-developing squabble. A *CW* spot-check of traffic managers found that many are willing to take a stand, however, if the need arises. If drought conditions don't ease this year, they'll have to make their views known.

New *Tri-Sure*® Plant in Australia

the latest link in TRI-SURE THE WORLD OVER

The new Tri-Sure Plant at Villawood, N.S.W., Australia

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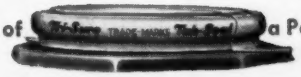
The Sign of  a Perfect Seal

Tri-Sure* Closures for drums and pails are now being manufactured in this modern new plant just outside of Sydney, Australia—the latest advance in Tri-Sure's world-wide program.

This new plant provides Far East industry with a fast, efficient source of supply of Tri-Sure Flanges, Plated Steel Plugs, Die Cast Plugs and Cap Seals for Drums, as well as Tri-Sure Nozzles and Caps, and Push-pull Spouts for Pails. In addition it offers closure users in that area the *quality* gaskets that are so vital to dependable closure performance.

This newest Tri-Sure plant underscores what is widely recognized among closure users all over the world: wherever *your* plant is located, there is a Tri-Sure plant, and engineer, to serve you—and Tri-Sure Closures that will best serve the needs of your products.

*The "Tri-Sure" Trademark is a mark of reliability backed by over 35 years serving industry.

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February 9, 1957

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New York 36 ... Knox Armstrong, P. F. McPherson, Charles F. Onasch, L. Charles Todaro, 330 West 42 St. LOngacre 4-3000

Philadelphia 3 William B. Hannum, Jr. Architects Bldg., 17th & Sansom Sts., RIttenhouse 6-0670

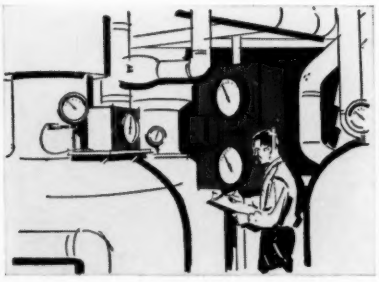
Pittsburgh 22 ... 919 Oliver Bldg. Atlantic 1-4707

San Francisco 4 ... William C. Woolston, 68 Post St., Douglas 2-4600

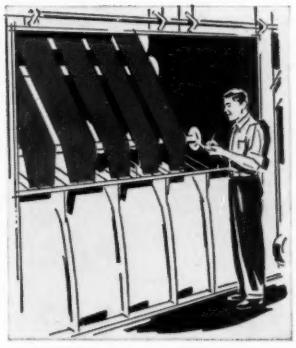
St. Louis 8 ... 3615 Olive St. Continental Bldg., Jefferson 5-4867

B&A Cuprous Chloride

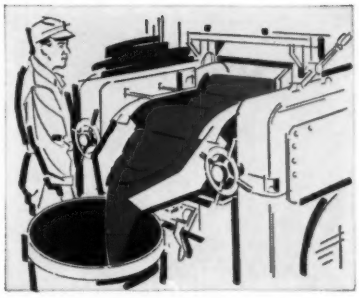
TECHNICAL



For use as a catalyst in the manufacture of acrylonitrile



. . . in the manufacture of vat dyestuffs



. . . in the manufacture of phthalocyanine pigments

. . . in the manufacture of special batteries (see note)

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Baker & Adamson has long been industry's primary source of high-quality Cuprous Chloride. With its two large furnaces, B&A has geared its productive capacity to serve today's tonnage users as well as companies anticipating increased consumption in the future.

The typical analysis listed at the right shows *one* big reason why B&A Cuprous Chloride is preferred. The *other* reason is its ready availability.

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TYPICAL ANALYSIS

Assay (CuCl)	97-99%
Insoluble in HCl	0.01%
Sulfate (SO_4)	0.005%
Iron (Fe)	0.01%

Screen Size:
90% thru 100 mesh; 1% max. on 40 mesh.

NOTE: A finer particle size of this product, approximately 100 mesh, is also available for use in the manufacture of special batteries, or for other purposes where a smaller particle size is required.

Shipping Containers:
100-lb. and 350-lb. drums with polyethylene bag liners.

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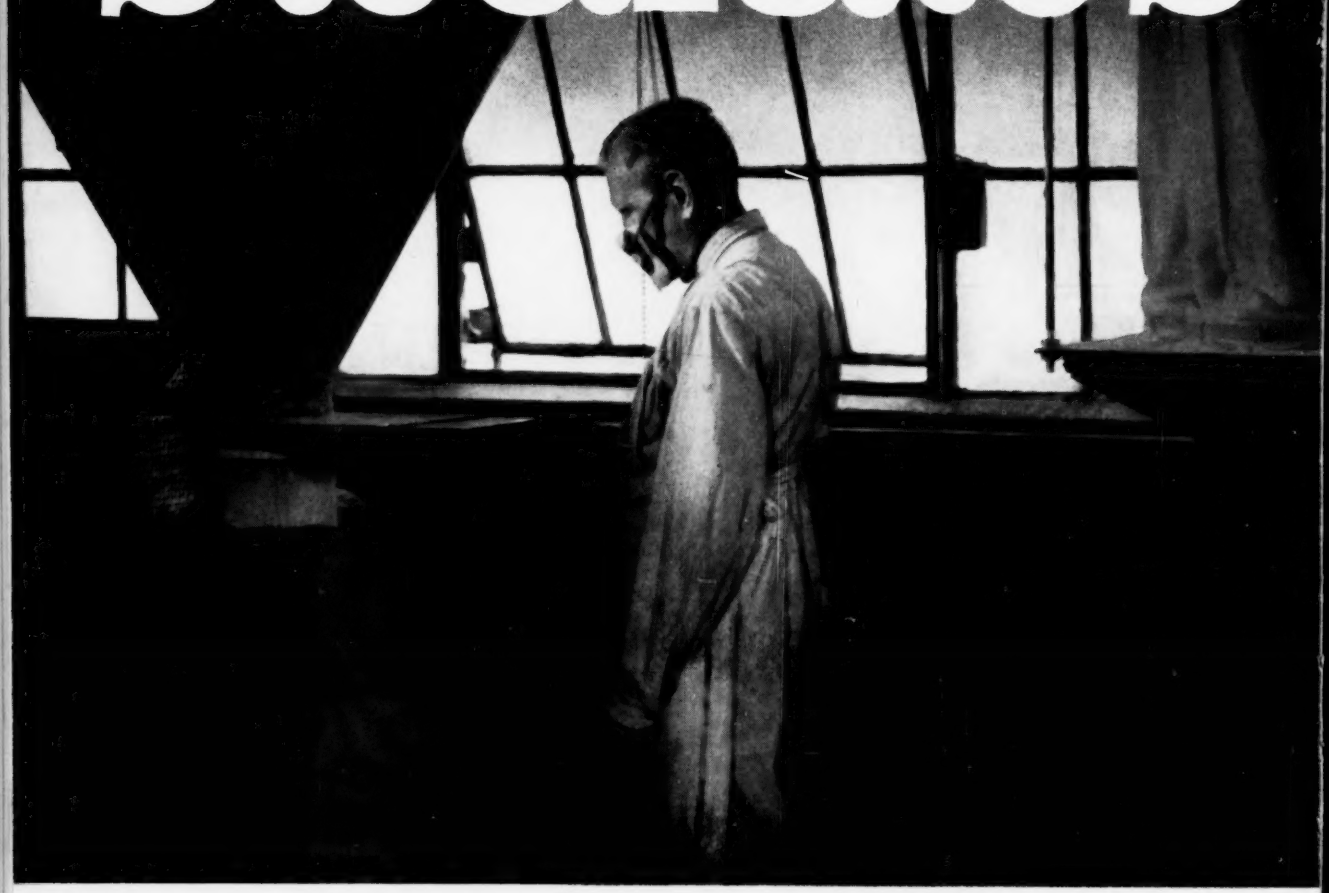
stearates



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